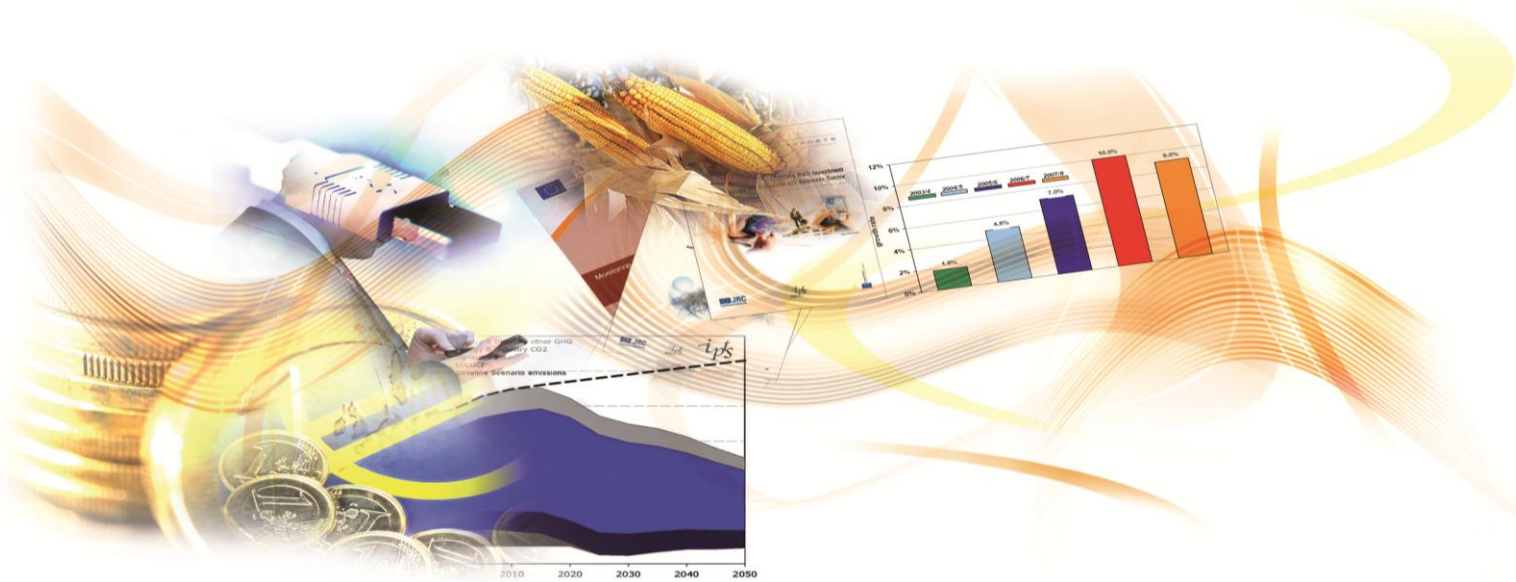
European Commission

JRC TECHNICAL REPORTS

Study on methodological aspects regarding limit values for pollutants in aggregates in the context of the possible development of end-of-waste criteria under the EU Waste Framework Directive
Appendix Part 2

Hans Saveyn, Peter Eder, Elena Garbarino, Lenka Muchova, Ole Hjelmar, Hans van der Sloot, Rob Comans, André van Zomeren, Jiri Hyks, Anke Oberender

2014



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Joint Research Centre
Institute for Prospective Technological Studies

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Study on methodological aspects regarding limit values for pollutants in aggregates in the context of the possible development of end-of-waste criteria under the EU Waste Framework Directive

Final Report
September 2014

Appendix Part 2:
Statistical data on various aggregate types

JRC-IPTS

Hans Saveyn[1], Peter Eder[1], Elena Garbarino[1], Lenka Muchova[1], Ole Hjelmar[2], Hans van der Sloot[3], Rob Comans[4], André van Zomeren[4], Jiri Hyks[2], Anke Oberender[2]

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Statistical data by material and by substance

The information consists of average, median, standard deviation +*, standard deviation -*, 90 % confidence limit +*, 90 % confidence limit -*, number of observations and pH condition chosen (in case of L/S it is always judged at L/S=10) based on log transformed data.

Statistical data for full pH and full L/S range

Data from part 1 have been treated to generate average, median and 90 % confidence limit data for selected (sufficient amount of data) materials

* the annotation + and – indicate that the standard deviation and confidence limit for log transformed data after back calculation to normal values are not equal.

RecCon		pH dependence			mg/kg		
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n
As	0.055	0.056	0.195	0.015	0.156	0.019	47
Ba	14.74	15.74	32.07	6.78	27.92	7.78	45
Cd	0.0055	0.0050	0.0257	0.0012	0.0195	0.0016	38
Ca	55165	60176	101949	29850	91375	33304	45
Cl	684	422	4581	102	3264	143	11
Cr	2.17	4.27	30.90	0.153	19.25	0.245	47
Cu	0.0320	0.0236	0.2909	0.0035	0.1963	0.0052	42
Mo	0.227	0.137	1.332	0.039	0.972	0.053	43
Ni	2.89	1.72	16.20	0.52	11.92	0.70	42
Pb	0.071	0.138	0.329	0.015	0.250	0.020	38
Sb	0.065	0.064	0.225	0.019	0.181	0.023	43
Se	0.064	0.062	0.197	0.021	0.161	0.025	43
V	0.73	0.99	2.59	0.21	2.06	0.26	45
Zn	0.253	0.235	0.942	0.068	0.746	0.086	42

RecCon		Percolation					
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n
As	0.198	0.250	0.467	0.084	0.400	0.098	79
Ba	3.72	4.00	8.08	1.71	7.04	1.97	112
Cd	0.0045	0.0050	0.0067	0.0031	0.0063	0.0033	80
Cl	98	98	197	49	174	55	91
Cr	0.062	0.050	0.105	0.036	0.095	0.040	88
Cu	0.127	0.125	0.238	0.068	0.213	0.076	94
Mo	0.057	0.058	0.099	0.032	0.090	0.036	91
Ni	0.053	0.050	0.094	0.030	0.085	0.033	80
Pb	0.102	0.100	0.165	0.063	0.151	0.068	81
Sb	0.019	0.020	0.025	0.015	0.024	0.016	79
Se	0.020	0.020	0.023	0.017	0.023	0.018	78
V	0.091	0.100	0.170	0.049	0.152	0.054	81
Zn	0.190	0.200	0.277	0.130	0.259	0.139	81

RecBrick		**pH dependence**			mg/kg			
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	pH
Ba	2.173	2.009	5.956	0.793	4.976	0.949	4	7
Cr	0.217	0.348	2.848	0.017	1.800	0.026	4	7
Cu	0.018	0.015	0.034	0.010	0.031	0.011	4	7
Mo	0.053	0.053	0.162	0.017	0.133	0.021	2	9
Ni	0.146	0.146	0.604	0.035	0.469	0.046	2	7
Pb	0.027	0.042	0.096	0.008	0.077	0.010	4	7
SO4	160	160	163	157	162	158	2	9
Sn	0.028	0.028	0.080	0.010	0.066	0.012	2	7
V	0.077	0.050	0.437	0.014	0.321	0.019	4	9
Zn	0.299	0.369	1.826	0.049	1.322	0.067	4	10

RecBrick		**Percolation**						
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.0220	0.0395	0.0756	0.0064	0.0607	0.0080	10	10
Ba	0.54	0.27	2.50	0.12	1.90	0.15	8	10
Cd	0.0018	0.0020	0.0023	0.0014	0.0022	0.0014	7	10
Cl	91	128	249	33	208	40	7	10
Cr	0.126	0.122	0.165	0.096	0.157	0.101	4	10
Cu	0.081	0.101	0.173	0.038	0.151	0.043	10	10
Mo	0.107	0.105	0.144	0.080	0.136	0.085	7	10
Ni	0.0355	0.0978	0.1643	0.0077	0.1250	0.0101	10	10
Pb	0.0228	0.0441	0.0803	0.0065	0.0641	0.0081	10	10
SO4	365	308	1600	83	1229	108	7	10
Zn	0.0341	0.0300	0.4846	0.0024	0.3019	0.0038	5	10

RecGls		pH dependence test			mg/kg			
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	pH
As	0.06628	0.06628	0.96343	0.00456	0.59782	0.00735	2	7
Ba	1.59	2.35	9.69	0.26	7.03	0.36	6	7
Cd	0.00067	0.00080	0.00289	0.00015	0.00223	0.00020	3	7
Cr	0.0152	0.0149	0.0285	0.0081	0.0255	0.0090	4	7
Cu	0.0291	0.0173	0.1504	0.0056	0.1122	0.0075	6	7
Mo	0.1359	0.1499	0.2639	0.0700	0.2345	0.0788	3	7
Ni	0.0423	0.0300	0.1490	0.0120	0.1190	0.0150	5	7
Pb	0.1468	0.0868	4.6753	0.0046	2.5225	0.0085	6	7
SO4	11.58	8.50	30.80	4.35	25.87	5.18	3	7
Sb	0.2486	0.2734	1.9496	0.0317	1.3505	0.0458	34	7
Sn	0.0310	0.0300	0.0491	0.0196	0.0453	0.0213	3	7
V	0.0097	0.0090	0.0125	0.0076	0.0119	0.0079	3	7
Zn	2.01	1.40	31.65	0.13	19.36	0.21	35	7

RecGls		Percolation test						
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
Ba	1.48	4.05	10.41	0.21	7.35	0.30	11	10
Co	0.026	0.030	0.065	0.011	0.055	0.012	3	10
Cu	0.040	0.030	0.137	0.012	0.110	0.014	11	10
Pb	1.206	0.740	11.852	0.123	7.886	0.184	11	10
Sb	0.092	0.090	0.505	0.017	0.373	0.023	11	10
Zn	0.274	0.170	1.301	0.058	0.985	0.076	11	10

All-C&D derived Aggregates **pH dependence test** mg/kg

Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	pH
As	0.0230	0.0310	0.1249	0.0043	0.0924	0.0057	94	7
Ba	4.25	7.31	20.67	0.87	15.59	1.16	45	7
Cd	0.0020	0.0025	0.0189	0.0002	0.0126	0.0003	39	7
Cl	73.3	83.0	351.2	15.3	265.6	20.3	64	7
Cr	0.1180	0.0702	2.5071	0.0056	1.4538	0.0096	49	7
Cu	0.0342	0.0218	0.2278	0.0051	0.1625	0.0072	92	7
Mo	0.0403	0.0402	0.2490	0.0065	0.1800	0.0090	39	7
Ni	0.0910	0.0999	1.2235	0.0068	0.7698	0.0108	92	7
Pb	0.0597	0.0999	0.3056	0.0117	0.2284	0.0156	94	7
SO4 as S	253	1131	4356	15	2623	24	41	7
Sb	0.0155	0.0226	0.0887	0.0027	0.0650	0.0037	38	7
Se	0.0303	0.0286	0.1494	0.0061	0.1124	0.0081	40	7
V	0.0811	0.2198	1.3815	0.0048	0.8333	0.0079	45	10
Zn	0.0967	0.0999	0.5483	0.0171	0.4024	0.0233	94	7

All-C&D derived Aggregates **pH dependence test** mg/kg

Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.15124102	0.24990746	0.46107586	0.04960973	0.37797406	0.06051698	449	10
Cr	0.09298365	0.08994214	0.18638815	0.04638685	0.1646542	0.0525098	432	10
Zn	0.15124102	0.24990746	0.46107586	0.04960973	0.37797406	0.06051698	449	10

RecAsph		pH dependence test			mg/kg			
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	pH
As	0.0330	0.0305	0.1120	0.0097	0.0901	0.0121	5	8
Ba	0.2878	0.1235	2.3083	0.0359	1.5925	0.0520	5	8
Cd	0.0089	0.0050	0.0246	0.0032	0.0205	0.0038	3	8
Cl	125	127	133	117	131	118	3	8
Cr	0.0100	0.0165	0.0918	0.0011	0.0618	0.0016	9	8
Cu	0.0652	0.0172	0.5877	0.0072	0.3972	0.0107	5	8
Mo	0.0433	0.0402	0.0555	0.0337	0.0531	0.0353	3	8
Ni	0.4563	0.3289	6.9092	0.0301	4.2562	0.0489	5	8
Pb	0.0289	0.0523	0.1735	0.0048	0.1261	0.0066	5	8
SO4 as S	0.8820	0.7444	1.6050	0.4847	1.4425	0.5393	3	8
Sb	0.0565	0.0545	0.0745	0.0429	0.0709	0.0451	3	8
Se	0.0886	0.0999	0.1462	0.0537	0.1337	0.0587	3	8
Sn	0.0458	0.0334	0.0825	0.0254	0.0742	0.0282	3	8
V	0.0080	0.0101	0.0121	0.0054	0.0112	0.0058	3	8
Zn	1.9474	0.4432	54.5096	0.0696	30.0944	0.1260	7	8

RecAsph		Percolation test						
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.2458	0.2499	0.4114	0.1469	0.3753	0.1610	21	10
Ba	0.1168	0.0919	0.2517	0.0542	0.2195	0.0621	27	10
Cd	0.0046	0.0050	0.0065	0.0033	0.0061	0.0035	20	10
Cl	41.6	42.0	72.2	24.0	65.5	26.4	25	10
Cr	0.0505	0.0500	0.0828	0.0308	0.0758	0.0337	24	10
Cu	0.0724	0.0500	0.1135	0.0462	0.1048	0.0501	22	10
Mo	0.0815	0.0879	0.1396	0.0475	0.1269	0.0523	26	10
Ni	0.0496	0.0500	0.0754	0.0326	0.0700	0.0351	21	10
Pb	0.0841	0.0999	0.1378	0.0513	0.1262	0.0561	20	10
SO4 as S	235	250	395	140	360	153	24	10
Sb	0.0261	0.0275	0.0375	0.0182	0.0352	0.0194	26	10
Se	0.0188	0.0200	0.0246	0.0144	0.0234	0.0151	20	10
V	0.2486	0.2599	0.4869	0.1270	0.4319	0.1431	22	10
Zn	0.1805	0.1999	0.2694	0.1210	0.2508	0.1299	24	10

BFS		pH dependence test			mg/kg			
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	pH
As	0.0177	0.0307	0.0481	0.0065	0.0403	0.0078	5	10
Ba	5.03	4.55	8.83	2.87	7.99	3.17	4	7
Cd	0.0020	0.0011	0.0062	0.0006	0.0051	0.0008	3	7
Cl	740	834	988	554	938	583	3	10
Cr	0.0357	0.0396	0.0451	0.0282	0.0432	0.0294	6	10
Cu	0.0050	0.0066	0.0104	0.0024	0.0091	0.0027	4	7
Mo	0.0180	0.0144	0.0537	0.0060	0.0442	0.0073	6	10
Ni	0.0429	0.0326	0.1164	0.0158	0.0974	0.0189	4	7
Pb	0.0076	0.0038	0.0915	0.0006	0.0588	0.0010	4	7
SO4 as S	3194	2549	6338	1609	5609	1818	4	10
Sb	0.0422	0.0357	0.0632	0.0282	0.0588	0.0303	6	10
Se	0.0270	0.0284	0.0467	0.0156	0.0424	0.0172	5	10
Sn	0.0104	0.0130	0.0182	0.0059	0.0165	0.0066	4	7
V	0.686	1.041	2.776	0.169	2.164	0.217	30	10
Zn	0.028	0.022	0.087	0.009	0.071	0.011	33	7

BFS		Percolation test						
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.043	0.020	0.165	0.011	0.130	0.014	15	10
Ba	5.71	8.03	16.14	2.02	13.41	2.43	14	10
Cd	0.003	0.005	0.007	0.001	0.006	0.001	15	10
Cl	56.3	32.8	188.2	16.9	151.8	20.9	16	10
Cr	0.019	0.013	0.075	0.005	0.059	0.006	18	10
Cu	0.012	0.011	0.022	0.006	0.020	0.007	22	10
Mo	0.023	0.025	0.039	0.013	0.036	0.014	13	10
Ni	0.044	0.050	0.086	0.023	0.077	0.025	15	10
Pb	0.056	0.058	0.119	0.027	0.104	0.030	16	10
SO4 as S	1053	1125	2651	418	2249	493	21	10
Sb	0.014	0.014	0.020	0.009	0.019	0.010	14	10
Se	0.017	0.020	0.040	0.007	0.035	0.008	14	10
Sn	0.060	0.039	0.170	0.021	0.141	0.025	13	10
V	0.272	0.196	1.265	0.058	0.961	0.077	39	10
Zn	0.038	0.029	0.142	0.010	0.112	0.013	39	10

BOF		pH dependence test			mg/kg			
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	pH
As	0.0163	0.0181	0.0372	0.0071	0.0321	0.0082	12	10
Ba	2.094	2.650	6.413	0.684	5.253	0.835	15	7
Cd	0.0010	0.0006	0.0036	0.0003	0.0029	0.0004	15	7
Cl	163.8	143.3	339.3	79.1	298.0	90.0	7	10
Cr	0.0420	0.0262	0.1684	0.0105	0.1314	0.0134	13	10
Cu	0.0045	0.0028	0.0240	0.0008	0.0178	0.0011	15	7
Mo	0.0385	0.0483	0.2486	0.0060	0.1783	0.0083	12	10
Ni	0.0429	0.0801	0.3260	0.0056	0.2270	0.0081	15	7
Pb	0.0176	0.0105	0.0819	0.0038	0.0623	0.0050	15	7
SO4 as S	31.89	48.12	182.73	5.57	133.85	7.60	15	10
Sb	0.0097	0.0123	0.0309	0.0031	0.0252	0.0038	12	10
Se	0.0365	0.0386	0.0821	0.0162	0.0711	0.0187	11	10
Sn	0.0056	0.0067	0.0144	0.0022	0.0122	0.0026	13	7
V	0.686	1.041	2.776	0.169	2.164	0.217	30	10
Zn	0.0282	0.0220	0.0873	0.0091	0.0714	0.0111	33	7

BOF		Percolation test						
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.0725	0.1749	0.2389	0.0220	0.1931	0.0272	58	10
Ba	3.23	4.04	8.49	1.23	7.15	1.46	96	10
Cd	0.0026	0.0035	0.0058	0.0011	0.0050	0.0013	58	10
Cl	16.96	16.76	48.56	5.92	40.25	7.14	70	10
Cr	0.0337	0.0350	0.0907	0.0125	0.0760	0.0149	58	10
Cu	0.0288	0.0350	0.0677	0.0122	0.0581	0.0143	58	10
Mo	0.0243	0.0215	0.0513	0.0115	0.0449	0.0131	82	10
Ni	0.0371	0.0350	0.0834	0.0165	0.0722	0.0191	58	10
Pb	0.0639	0.0700	0.1208	0.0338	0.1078	0.0379	58	10
SO4	8.02	8.73	17.69	3.63	15.36	4.18	56	10
Sb	0.0138	0.0140	0.0190	0.0101	0.0179	0.0107	56	10
Se	0.0145	0.0140	0.0211	0.0100	0.0197	0.0106	56	10
Sn	0.0690	0.1399	0.2099	0.0227	0.1721	0.0276	56	10
V	0.2716	0.1958	1.2648	0.0583	0.9614	0.0767	39	10
Zn	0.0379	0.0286	0.1419	0.0101	0.1121	0.0128	39	10

EAF **pH dependence test** mg/kg

Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	pH
As	0.083183	0.099907	0.125314	0.055217	0.116485	0.059402	5	10
Ba	186.1488	182.249	219.3402	157.9801	213.0167	162.6698	4	7
Cr	0.371653	0.634544	3.036769	0.045485	2.088157	0.066147	5	10
Mo	4.501741	4.746933	6.142195	3.299419	5.811185	3.487357	4	10
V	4.026242	3.611748	6.211321	2.609851	5.749299	2.819583	4	10
Zn	0.15491	0.144391	0.251312	0.095488	0.230541	0.104091	4	7
Cl	18.10837	18.86386	57.00527	5.752328	46.46442	7.057293	4	10

EAF **Percolation test** mg/kg

Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.081273	0.249907	0.373156	0.017701	0.284363	0.023228	7	10
Ba	0.273279	0.288277	1.653953	0.045153	1.199819	0.062244	7	10
Cl	12.1349	12.0356	32.71704	4.500888	27.41435	5.371483	8	10
Cr	0.089797	0.099939	0.472645	0.01706	0.351512	0.022939	7	10
Cu	0.06534	0.104818	0.264569	0.016137	0.206183	0.020706	8	10
Mo	1.157995	1.237444	1.765217	0.759653	1.6374	0.818952	4	10
Ni	0.062208	0.062388	0.502401	0.007703	0.346183	0.011179	6	10
Pb	0.112499	0.249971	0.36262	0.034902	0.294325	0.043	7	10
Sb	0.044845	0.029972	0.226238	0.008889	0.169533	0.011862	5	10
V	0.104001	0.100118	0.253249	0.042709	0.216091	0.050053	4	10
Zn	0.085051	0.099951	0.162434	0.044533	0.144736	0.049978	8	10

Pslag		**Percolation**			mg/kg			
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.0652	0.1145	0.2412	0.0176	0.1911	0.0223	8	10
Ba	1.388	2.097	4.158	0.464	3.420	0.564	7	10
Cd	0.014	0.015	0.030	0.007	0.026	0.008	8	10
Cr	0.045	0.072	0.121	0.017	0.101	0.020	8	10
Cu	0.124	0.158	0.231	0.066	0.207	0.074	8	10
Mo	0.175	0.241	0.687	0.045	0.539	0.057	8	10
Ni	0.176	0.264	0.846	0.036	0.639	0.048	8	10
Pb	0.224	0.265	0.886	0.057	0.694	0.073	8	10
Sb	0.095	0.177	0.638	0.014	0.454	0.020	7	10
Se	0.113	0.177	0.504	0.025	0.386	0.033	7	10
Sn	0.140	0.193	0.406	0.048	0.336	0.058	6	10
V	0.473	0.621	2.852	0.079	2.071	0.108	8	10
Zn	0.216	0.301	0.677	0.069	0.552	0.084	8	10

CFA		pH dependence test			mg/kg			
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	pH
As	0.109	0.107	0.467	0.025	0.360	0.033	12	10
Ba	3.54	4.93	10.36	1.21	8.55	1.46	10	7
Cd	0.00238	0.00251	0.06796	0.00008	0.03738	0.00015	18	7
Cl	77.8	58.8	186.3	32.5	159.4	38.0	6	10
Cr	1.13	1.41	6.15	0.21	4.55	0.28	95	10
Cu	0.00086	0.00119	0.05122	0.00001	0.02473	0.00003	15	7
Ni	0.275	0.500	2.226	0.034	1.533	0.049	17	7
Pb	0.01060	0.00726	0.78667	0.00014	0.36503	0.00031	18	7
SO4	1904	2205	4780	759	4057	894	7	10
Sb	0.114	0.122	0.306	0.043	0.257	0.051	10	10
Se	0.619	0.505	2.016	0.190	1.633	0.234	10	10
Sn	0.0027	0.0029	0.0218	0.0003	0.0150	0.0005	11	7
V	2.40	2.38	5.92	0.97	5.04	1.14	9	10
Zn	0.163	0.100	0.883	0.030	0.653	0.041	92	7

CFA		Percolation test						
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.1716	0.1999	0.7479	0.0394	0.5753	0.0512	37	10
Ba	3.59	3.80	10.39	1.24	8.60	1.50	21	10
Cd	0.0409	0.0500	0.3088	0.0054	0.2154	0.0078	37	10
Cl	89.1	100.1	385.8	20.6	297.1	26.7	35	10
Cr	3.238	2.045	29.020	0.361	19.629	0.534	102	10
Cu	0.152	0.100	0.517	0.045	0.416	0.056	32	10
Mo	6.230	7.904	13.579	2.858	11.818	3.284	8	10
Ni	0.198	0.300	0.707	0.056	0.564	0.070	35	10
Pb	0.2560	0.0999	3.2839	0.0200	2.0836	0.0315	37	10
SO4	3076	3732	9643	981	7865	1203	38	10
Sb	0.127	0.200	0.568	0.028	0.435	0.037	22	10
Se	0.231	0.300	1.124	0.048	0.848	0.063	23	10
Sn	0.064	0.050	0.338	0.012	0.251	0.017	11	10
V	1.682	1.900	6.023	0.470	4.797	0.590	27	10
Zn	0.326	0.200	2.893	0.037	1.960	0.054	97	10

CBA		**percolation**			mg/kg			
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.165	0.200	0.360	0.075	0.313	0.087	91	10
Ba	0.725	0.610	1.388	0.379	1.236	0.425	100	10
Cd	0.0095	0.0070	0.0226	0.0040	0.0194	0.0047	88	10
Cl	111.9	100.1	220.4	56.9	195.3	64.2	92	10
Cr	0.109	0.100	0.178	0.067	0.163	0.073	106	10
Cu	0.094	0.100	0.131	0.068	0.124	0.072	81	10
Mo	0.166	0.180	0.344	0.080	0.302	0.091	155	10
Ni	0.209	0.200	0.378	0.116	0.340	0.129	88	10
Pb	0.285	0.300	0.490	0.165	0.445	0.182	88	10
SO4	443	395	1092	180	930	211	168	10
Sb	0.0141	0.0090	0.0345	0.0058	0.0294	0.0068	154	10
Se	0.0142	0.0120	0.0252	0.0080	0.0227	0.0089	154	10
Sn	0.031	0.030	0.038	0.026	0.037	0.027	56	10
V	0.29	0.30	0.43	0.20	0.40	0.22	101	10
Zn	0.51	0.70	1.32	0.20	1.12	0.23	91	10

MSWIFA pH dependence

Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	pH
As	0.276	0.617	2.237	0.034	1.541	0.050	4	10
Ba	14.929	13.005	30.119	7.399	26.577	8.386	4	7
Cd	64.89	96.94	135.28	31.12	118.67	35.48	5	7
Cl	57971	63398	93333	36007	85736	39198	4	10
Cr	8.08	8.34	12.68	5.15	11.70	5.58	4	10
Cu	2.542	1.980	13.386	0.483	9.955	0.649	5	7
Mo	5.49	5.57	6.75	4.46	6.51	4.62	4	10
Ni	1.09	1.49	2.21	0.53	1.95	0.61	4	7
Pb	14.59	8.27	55.75	3.82	43.90	4.85	5	7
SO4	18403	17834	24718	13702	23451	14442	4	10
Sb	0.28	0.28	1.81	0.04	1.30	0.06	2	10
Se	0.337	0.337	0.497	0.229	0.464	0.245	2	10
Zn	696.8	667.1	1576.0	308.1	1362.6	356.4	5	7

MSWIFA Percolation

Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.041	0.013	0.218	0.008	0.162	0.010	5	10
Ba	4.328	5.530	12.382	1.512	10.266	1.824	4	10
Cd	1.34	2.38	11.72	0.15	7.96	0.22	6	10
Cl	174973	177594	444908	68813	376713	81270	3	10
Cr	0.17	0.15	0.54	0.05	0.44	0.07	5	10
Cu	0.439	0.322	2.905	0.066	2.074	0.093	6	10
Mo	9.28	8.95	18.23	4.72	16.16	5.32	6	10
Ni	0.08	0.06	1.51	0.00	0.90	0.01	5	10
Pb	24.33	19.02	168.58	3.51	119.37	4.96	5	10
SO4	17990	22785	31939	10133	28832	11225	5	10
Sb	0.02	0.04	0.14	0.00	0.10	0.00	5	10
Se	0.107	0.037	1.469	0.008	0.921	0.012	4	10
Sn	0.439	0.322	2.905	0.066	2.074	0.093	6	10
V	0.031	0.034	0.064	0.015	0.056	0.017	5	10
Zn	52.5	72.3	197.9	13.9	156.2	17.6	6	10

MSWIBA		pH dependence		mg/kg				
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	pH
As	0.018	0.016	0.078	0.004	0.060	0.005	29	10
Ba	1.02	1.17	5.73	0.18	4.21	0.25	28	7
Cd	0.112	0.132	0.344	0.037	0.282	0.045	35	7
Cl	2966	3377	7398	1189	6286	1399	20	10
Cr	0.106	0.090	0.405	0.028	0.319	0.035	29	10
Cu	5.00	6.19	16.59	1.51	13.40	1.87	36	7
Mo	0.92	0.81	1.93	0.44	1.69	0.50	27	10
Ni	1.20	1.53	2.85	0.51	2.45	0.59	28	7
Pb	0.114	0.087	0.548	0.024	0.414	0.031	36	7
SO4	1720	1715	2505	1181	2343	1263	28	10
Sb	0.77	0.75	1.73	0.34	1.50	0.39	25	10
Se	0.060	0.066	0.145	0.025	0.124	0.029	20	10
Sn	0.007	0.007	0.018	0.003	0.015	0.003	23	7
V	0.015	0.015	0.063	0.004	0.049	0.005	24	10
Zn	20.1	21.7	59.7	6.8	49.1	8.2	36	7

MSWIBA		Percolation						
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.0522	0.0300	0.1640	0.0166	0.1337	0.0204	46	10
Ba	1.34	1.15	3.87	0.46	3.20	0.56	49	10
Cd	0.0029	0.0050	0.0101	0.0008	0.0081	0.0010	60	10
Cl	2726	2965	4314	1722	3975	1869	102	10
Cr	0.0566	0.0693	0.2372	0.0135	0.1837	0.0174	63	10
Cu	3.25	3.19	6.36	1.66	5.64	1.87	173	10
Mo	0.88	0.87	1.47	0.53	1.34	0.58	171	10
Ni	0.1006	0.0999	0.2211	0.0458	0.1921	0.0527	58	10
Pb	0.2415	0.2999	0.8596	0.0679	0.6855	0.0851	101	10
SO4	648	676	1989	211	1629	258	16	10
Sb	0.18	0.18	0.34	0.10	0.30	0.11	156	10
Se	0.0244	0.0200	0.0414	0.0144	0.0377	0.0159	55	10
Sn	0.0469	0.0400	0.1288	0.0170	0.1076	0.0204	58	10
V	0.0852	0.0999	0.2685	0.0271	0.2188	0.0332	54	10
Zn	0.30	0.38	0.83	0.11	0.69	0.13	72	10

ArtAggr		**pH dependence test**			mg/kg			
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	pH
As	0.1353	0.1299	0.4190	0.0437	0.3425	0.0534	19	10
Ba	1.37	1.21	5.40	0.35	4.22	0.44	20	7
Cd	0.0056	0.0029	0.0533	0.0006	0.0357	0.0009	20	7
Cr	0.0543	0.0272	0.3914	0.0075	0.2752	0.0107	20	10
Cu	0.0268	0.0200	0.1604	0.0045	0.1166	0.0062	20	7
Mo	0.2422	0.2224	1.0001	0.0586	0.7766	0.0755	19	10
Ni	0.3935	0.4026	2.7495	0.0563	1.9441	0.0796	20	7
Pb	0.1809	0.1844	0.5439	0.0601	0.4470	0.0732	20	7
SO4 as S	157.3	179.7	867.7	28.5	639.9	38.7	19	10
Sb	0.0841	0.0845	0.4412	0.0160	0.3283	0.0215	19	10
Se	0.0655	0.0503	0.1543	0.0278	0.1325	0.0324	19	10
Sn	0.0354	0.0400	0.1805	0.0070	0.1350	0.0093	20	7
V	0.1210	0.0861	0.3531	0.0414	0.2917	0.0502	19	10
Zn	0.4466	0.3909	4.5744	0.0436	3.0213	0.0660	20	7

ArtAggr		**Percolation test**						
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.2447	0.3069	0.7181	0.0834	0.5927	0.1010	21	10
Ba	0.1696	0.0999	0.5791	0.0497	0.4652	0.0619	20	10
Cd	0.0037	0.0025	0.0114	0.0012	0.0093	0.0014	14	10
Cl	5.01	7.10	10.48	2.40	9.19	2.73	11	10
Cr	0.0388	0.0340	0.2589	0.0058	0.1846	0.0082	19	10
Cu	0.0303	0.0350	0.2978	0.0031	0.1982	0.0046	15	10
Mo	0.2473	0.1789	1.1227	0.0545	0.8573	0.0713	13	10
Ni	0.0187	0.0310	0.1338	0.0026	0.0942	0.0037	15	10
Pb	0.1911	0.1844	1.4686	0.0249	1.0209	0.0358	13	10
SO4 as S	207.3	389.1	2416.0	17.8	1559.3	27.5	11	10
Sb	0.1623	0.2050	0.4454	0.0592	0.3721	0.0708	12	10
Se	0.0570	0.0631	0.4355	0.0075	0.3031	0.0107	11	10
Sn	0.0157	0.0108	0.1103	0.0022	0.0779	0.0032	12	10
V	0.2601	0.5499	1.8381	0.0368	1.2970	0.0521	25	10
Zn	0.0878	0.0199	1.3608	0.0057	0.8347	0.0092	18	10

NatAggr		**pH dependence**		mg/kg				
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	pH
As	0.01724	0.00716	0.09588	0.00310	0.07061	0.00421	5	7
Ba	0.47	0.34	1.29	0.17	1.08	0.21	5	7
Cd	0.00023	0.00052	0.00142	0.00004	0.00103	0.00005	5	7
Cl	96	169	261	35	219	42	3	7
Cr	0.00140	0.00140	0.01722	0.00011	0.01102	0.00018	6	7
Cu	0.00736	0.00940	0.29532	0.00018	0.15292	0.00035	6	7
Mo	0.00209	0.00224	0.01486	0.00030	0.01048	0.00042	5	7
Ni	0.01047	0.01893	0.25484	0.00043	0.14424	0.00076	6	7
Pb	0.00301	0.00365	0.00675	0.00134	0.00584	0.00155	5	7
SO4	853	806	1519	479	1371	531	4	7
Sb	0.01869	0.01209	0.13392	0.00261	0.09427	0.00371	6	7
Se	0.01711	0.01911	0.05798	0.00505	0.04664	0.00628	5	7
Sn	0.00057	0.00061	0.00330	0.00010	0.00241	0.00013	5	7
V	0.00105	0.00219	0.04520	0.00002	0.02313	0.00005	5	7
Zn	0.06653	0.05116	0.24107	0.01836	0.19162	0.02310	7	7

NatAggr		**Percolation**						
Element	Average	Median	Std.Dev +	Std.Dev -	CL+ (90%)	CL- (90%)	n	L/S
As	0.0109	0.0140	0.0815	0.0015	0.0570	0.0021	14	10
Ba	0.0660	0.0698	0.1114	0.0391	0.1015	0.0429	10	10
Cd	0.0017	0.0010	0.0056	0.0005	0.0045	0.0006	15	10
Cl	7.33	7.31	11.75	4.57	10.81	4.98	11	10
Cr	0.0163	0.0150	0.0254	0.0105	0.0235	0.0114	15	10
Cu	0.0166	0.0200	0.0827	0.0033	0.0621	0.0044	15	10
Mo	0.0099	0.0112	0.0635	0.0015	0.0455	0.0021	12	10
Ni	0.0194	0.0349	0.1319	0.0029	0.0938	0.0040	16	10
Pb	0.0451	0.0351	0.0639	0.0319	0.0600	0.0339	13	10
SO4	20.3	17.6	32.4	12.7	29.8	13.8	11	10
Sb	0.0037	0.0063	0.0250	0.0005	0.0177	0.0008	11	10
Se	0.0098	0.0063	0.0184	0.0053	0.0164	0.0059	12	10
Sn	0.0212	0.0251	0.0981	0.0046	0.0746	0.0060	12	10
V	0.2530	0.4879	1.8954	0.0338	1.3236	0.0484	13	10
Zn	0.0351	0.0350	0.0517	0.0238	0.0483	0.0255	14	10

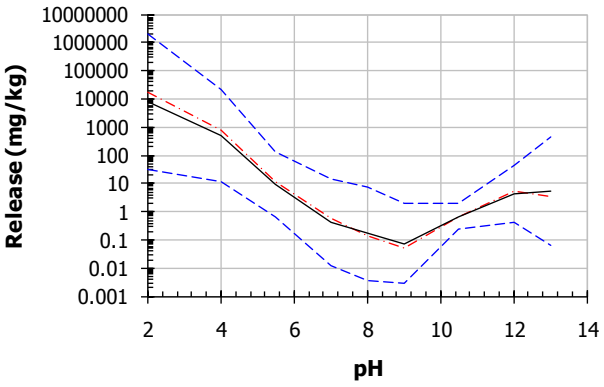
Not enough data were available for a valid statistical analysis.

GranTyr Percolation mg/kg

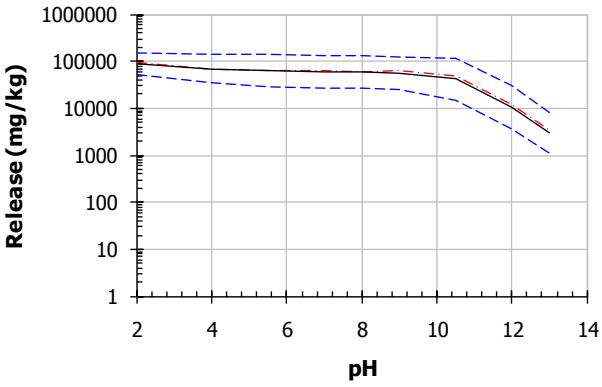
	Average mg/kg	Median mg/kg	StDev+ mg/kg	Stdev- mg/kg	n	pH
Ca	2785	2842	39783	195	6	7
Fe	1198	2846	24027	60	7	7
K	9172	15354	66319	1269	6	7
Mg	793	613	29846	21	6	7
Na	13786	28092	155283	1224	6	7
S	204	41	5668	7	14	7
Al	0.875	0.875	23.695	0.032	2	7
As	0.003	0.010	0.037	0.0002	7	7
Ba	0.83	0.40	5.41	0.13	19	7
Cd	0.001	0.004	0.021	0.0000	10	7
Co	0.030	0.058	0.343	0.0027	9	7
Cr	0.039	0.055	0.875	0.0017	16	7
Cu	0.016	0.060	0.717	0.0004	8	7
Hg	0.015	0.007	0.652	0.0004	6	7
Mn	0.29	0.72	9.85	0.01	12	7
Ni	0.009	0.018	0.114	0.0007	7	7
Pb	0.005	0.050	0.483	0.0001	7	7
Zn	3.1	4.6	63.6	0.1	27	7
Cl	7.4	7.5	10.7	5.2	8	7

Log normalized data

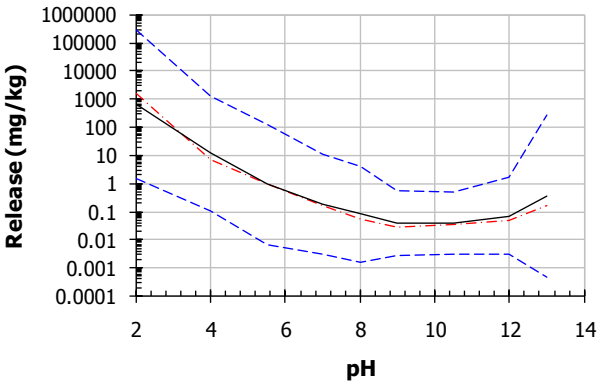
pH dependent release of Al



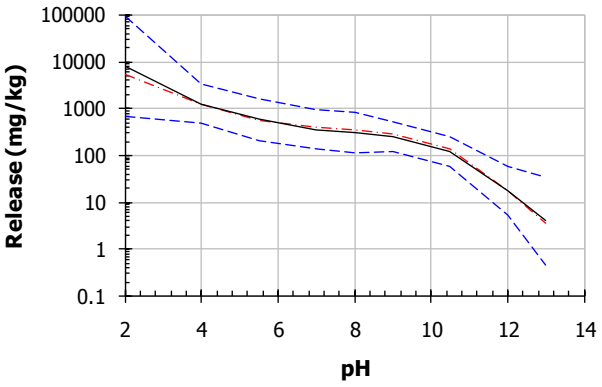
pH dependent release of Ca



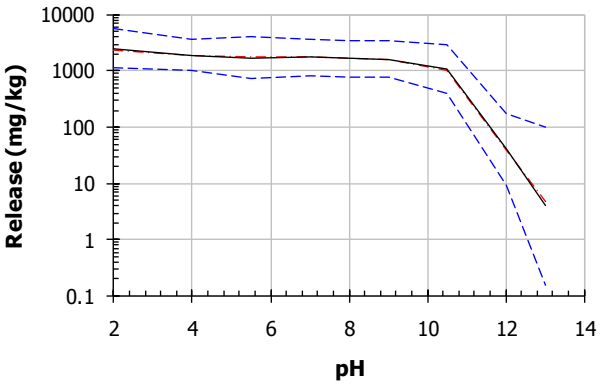
pH dependent release of Fe



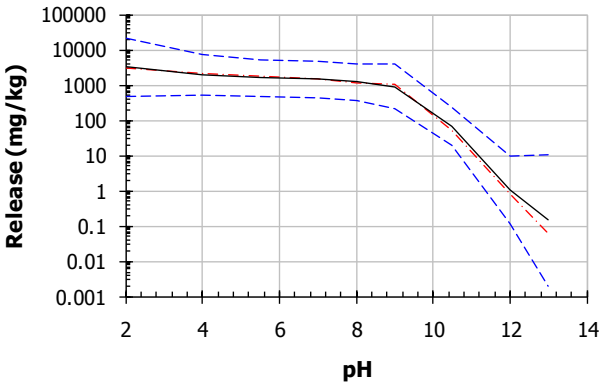
pH dependent release of Si



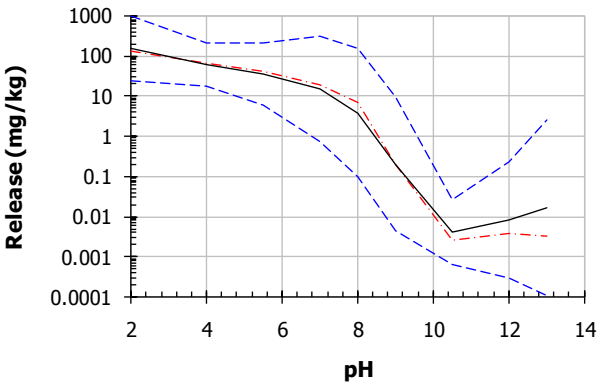
pH dependent release of S



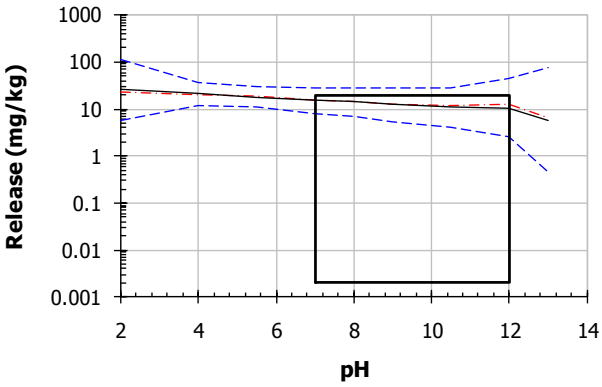
pH dependent release of Mg

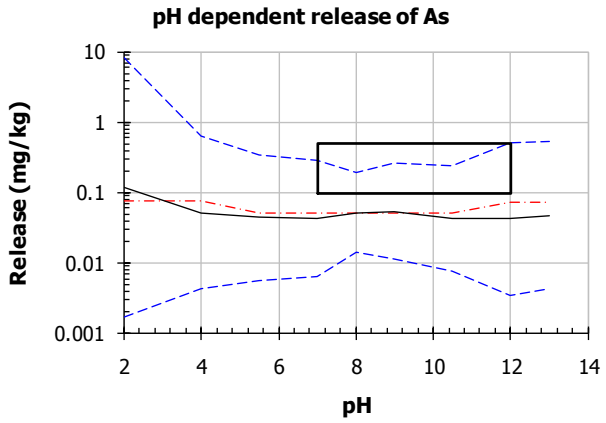


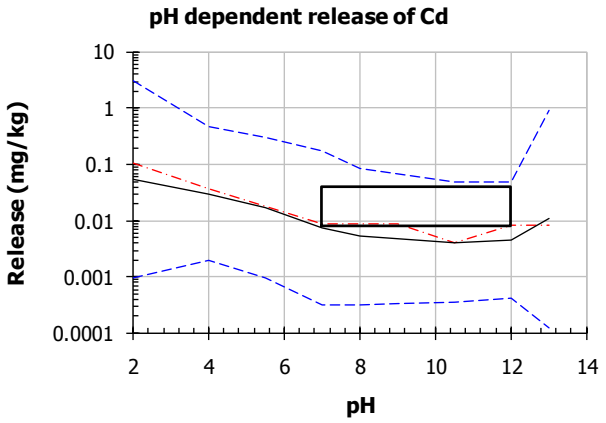
pH dependent release of Mn

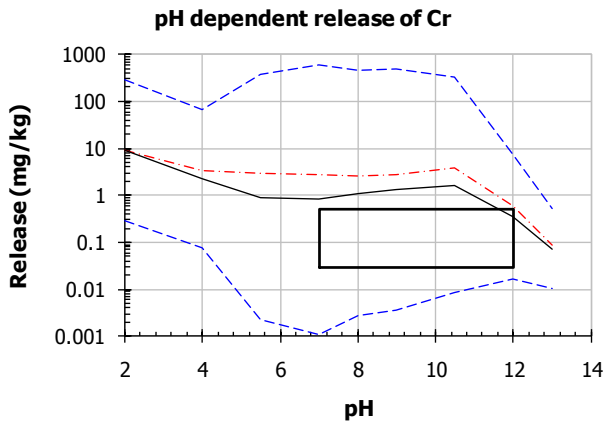


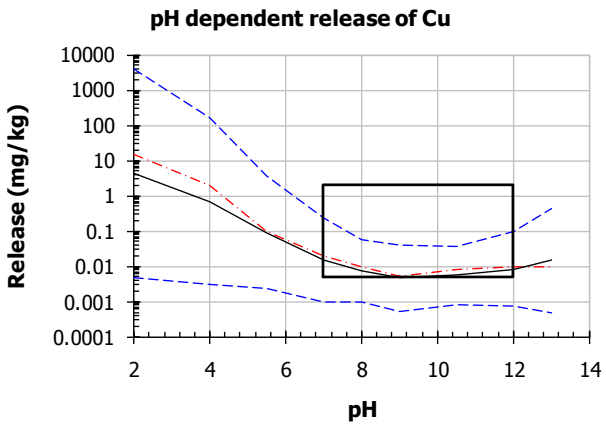
pH dependent release of Ba

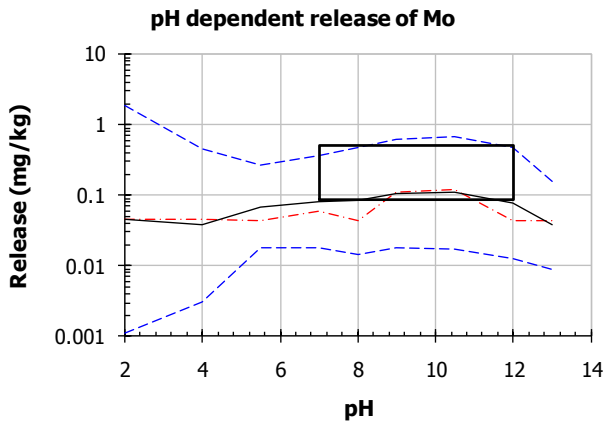


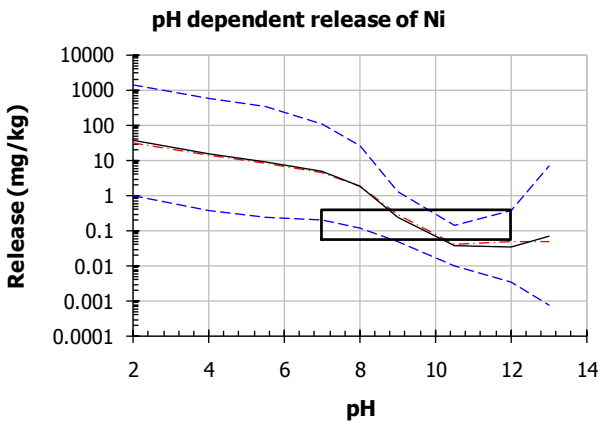

pH dependent release of As
Release (mg/kg)
10
1
0.1
0.01
0.001
2
4
6
8
10
12
14
pH

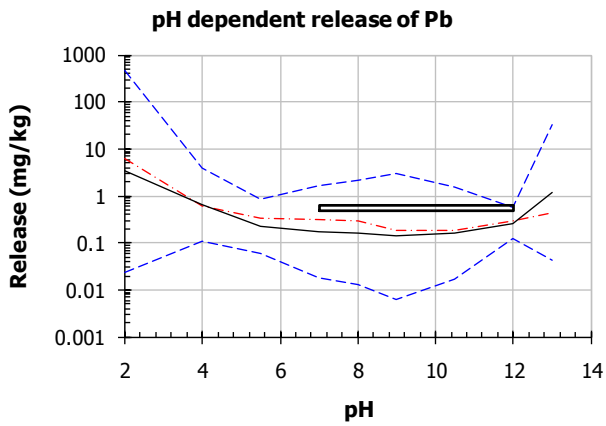

pH dependent release of Cd
Release (mg/kg)
10
1
0.1
0.01
0.001
0.0001
2
4
6
8
10
12
14
pH

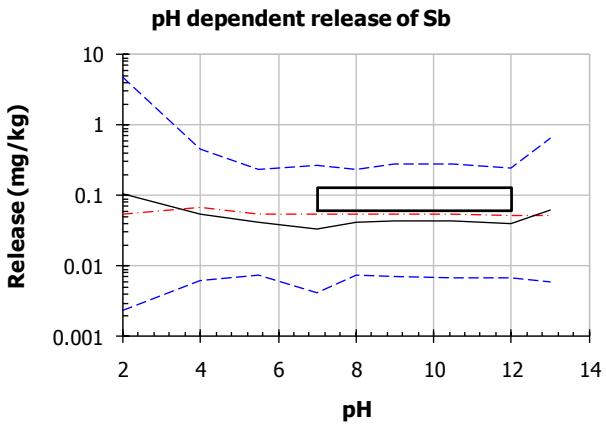

pH dependent release of Cr
Release (mg/kg)
1000
100
10
1
0.1
0.01
0.001
2
4
6
8
10
12
14
pH

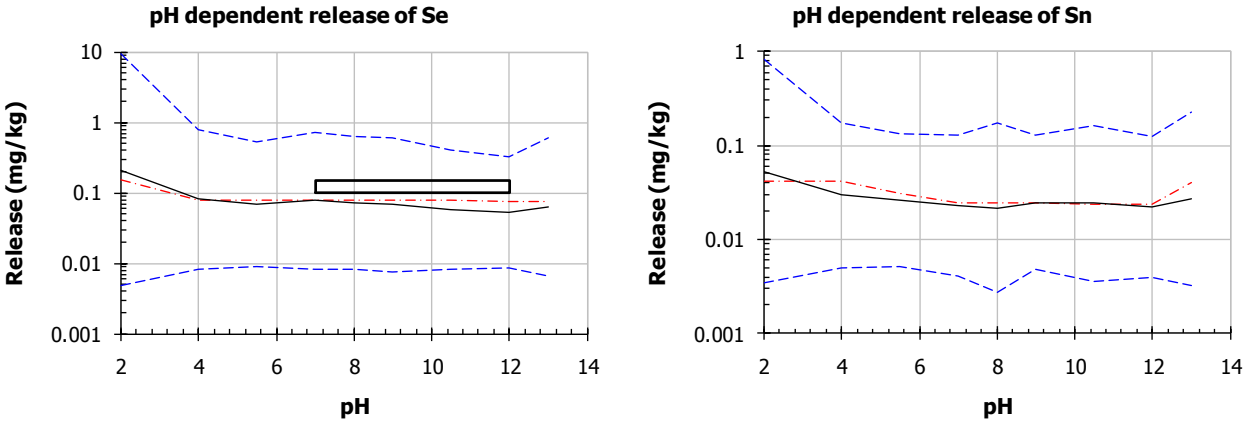

pH dependent release of Cu
Release (mg/kg)
10000
1000
100
10
1
0.1
0.01
0.001
0.0001
2
4
6
8
10
12
14
pH


pH dependent release of Mo
Release (mg/kg)
10
1
0.1
0.01
0.001
2
4
6
8
10
12
14
pH

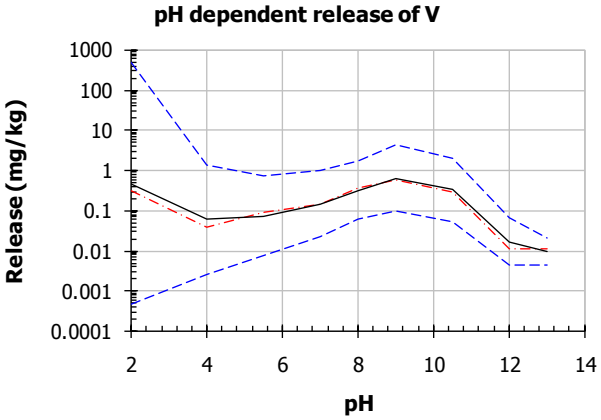

pH dependent release of Ni
Release (mg/kg)
10000
1000
100
10
1
0.1
0.01
0.001
0.0001
2
4
6
8
10
12
14
pH

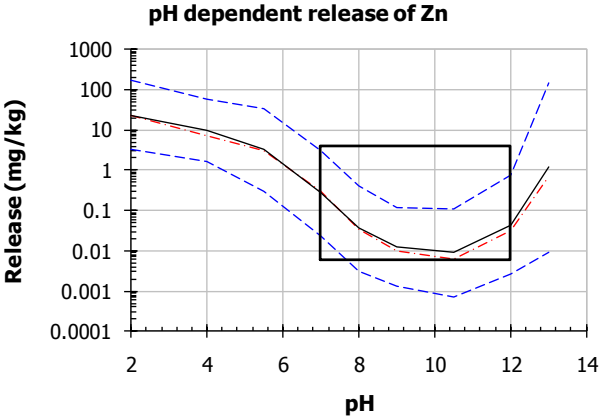

pH dependent release of Pb
Release (mg/kg)
1000
100
10
1
0.1
0.01
0.001
2
4
6
8
10
12
14
pH

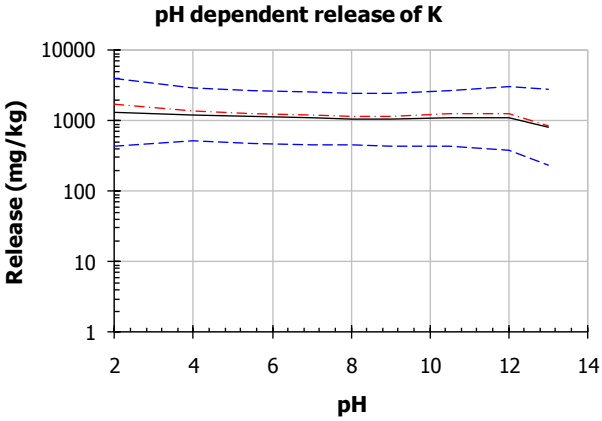

pH dependent release of Sb
Release (mg/kg)
10
1
0.1
0.01
0.001
2
4
6
8
10
12
14
pH

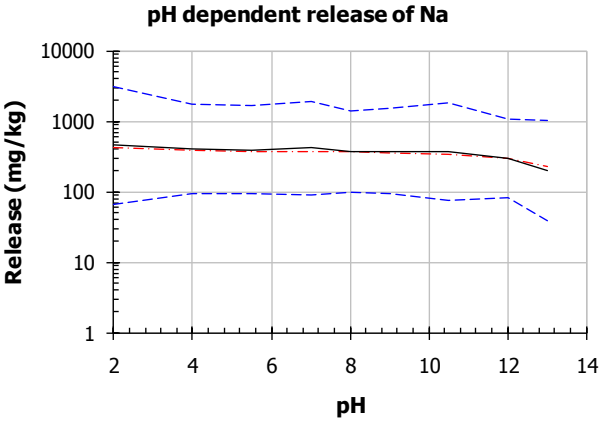

pH dependent release of Se
Release (mg/kg)
10
1
0.1
0.01
0.001
2 4 6 8 10 12 14
pH

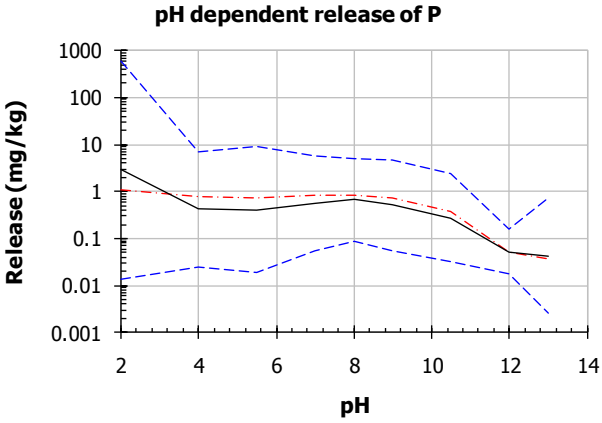
pH dependent release of Sn
Release (mg/kg)
1
0.1
0.01
0.001
2 4 6 8 10 12 14
pH

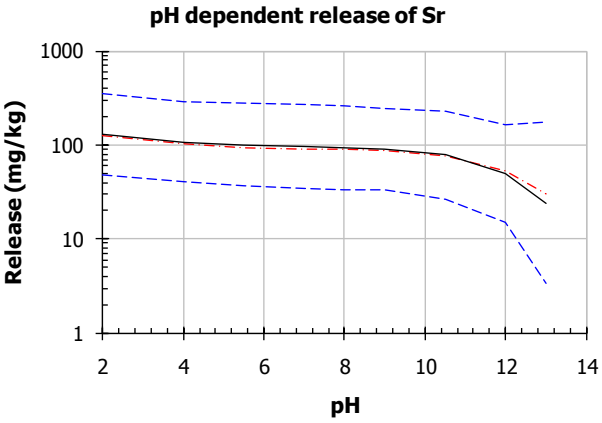

pH dependent release of V
Release (mg/kg)
1000
100
10
1
0.1
0.01
0.001
0.0001
2 4 6 8 10 12 14
pH


pH dependent release of Zn
Release (mg/kg)
1000
100
10
1
0.1
0.01
0.001
0.0001
2 4 6 8 10 12 14
pH


pH dependent release of K
Release (mg/kg)
10000
1000
100
10
1
2 4 6 8 10 12 14
pH


pH dependent release of Na
Release (mg/kg)
10000
1000
100
10
1
2 4 6 8 10 12 14
pH


pH dependent release of P
Release (mg/kg)
1000
100
10
1
0.1
0.01
0.001
2 4 6 8 10 12 14
pH


pH dependent release of Sr
Release (mg/kg)
1000
100
10
1
2 4 6 8 10 12 14
pH

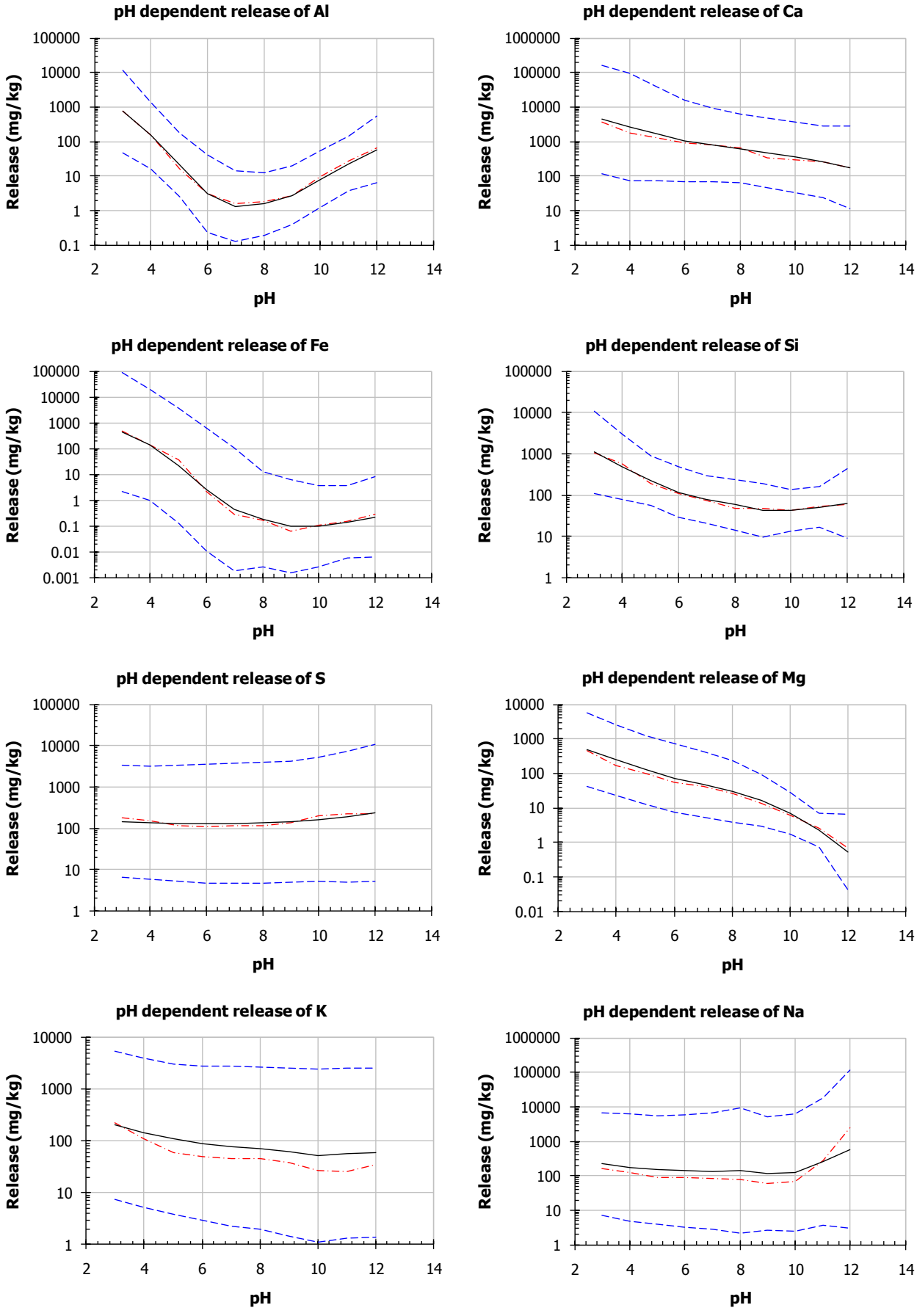
Legend

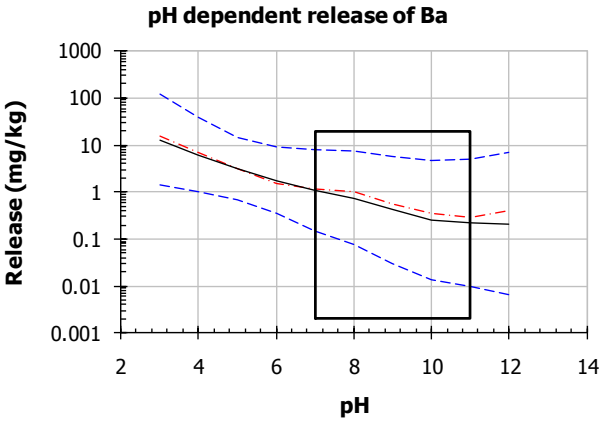
90 % Confidence intervals

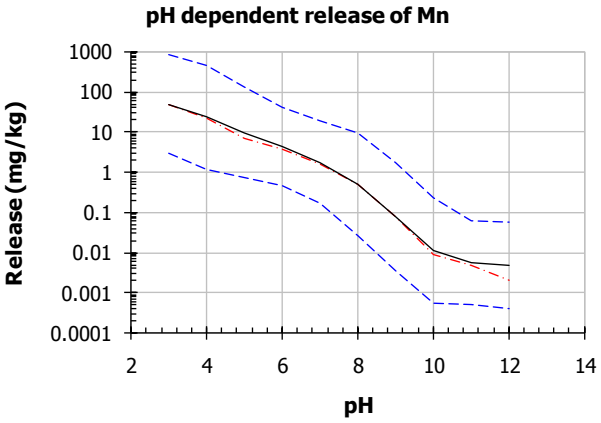
Recycled concrete Median

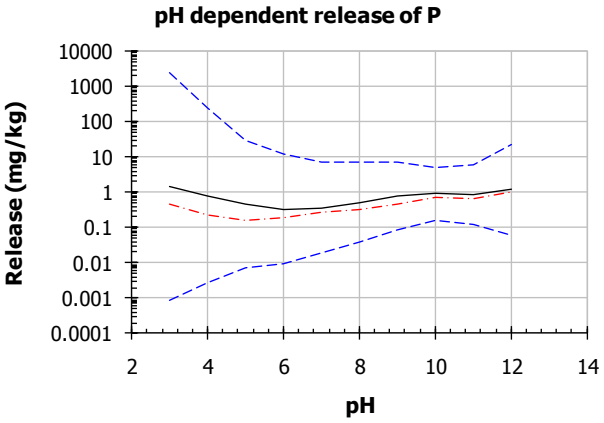
Recycled concrete Average

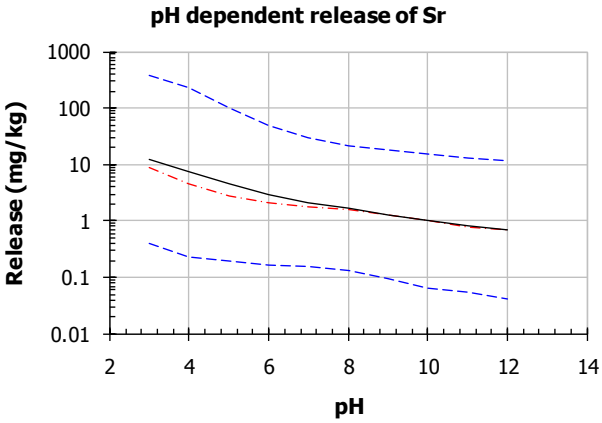
Box in pH dependence plot shows regulatory level (EU LFD Inert), relevant pH domain and detection limit..

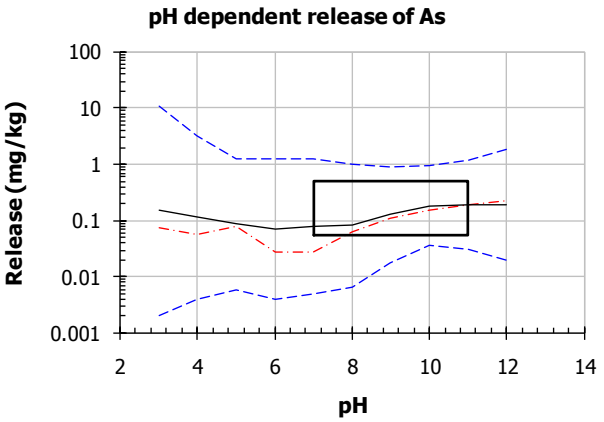

pH dependent release of Al
Release (mg/kg)
pH
pH dependent release of Ca
Release (mg/kg)
pH
pH dependent release of Fe
Release (mg/kg)
pH
pH dependent release of Si
Release (mg/kg)
pH
pH dependent release of S
Release (mg/kg)
pH
pH dependent release of Mg
Release (mg/kg)
pH
pH dependent release of K
Release (mg/kg)
pH
pH dependent release of Na
Release (mg/kg)
pH

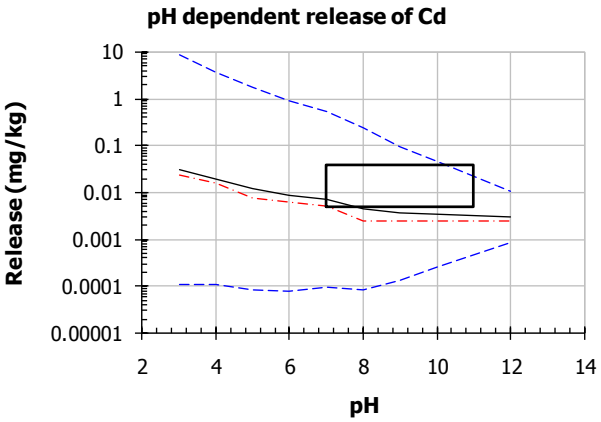

pH dependent release of Ba
Release (mg/kg)
1000
100
10
1
0.1
0.01
0.001
2 4 6 8 10 12 14
pH

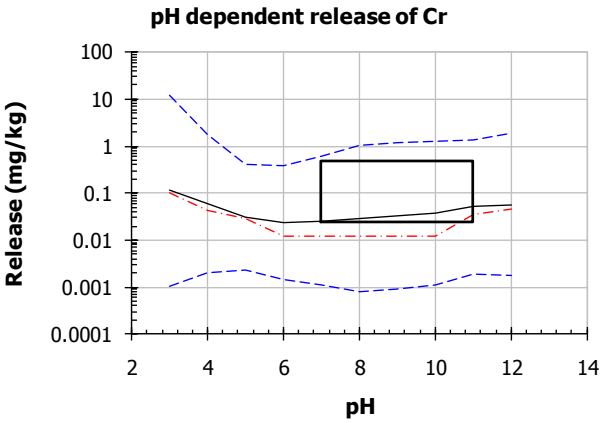

pH dependent release of Mn
Release (mg/kg)
1000
100
10
1
0.1
0.01
0.001
0.0001
2 4 6 8 10 12 14
pH

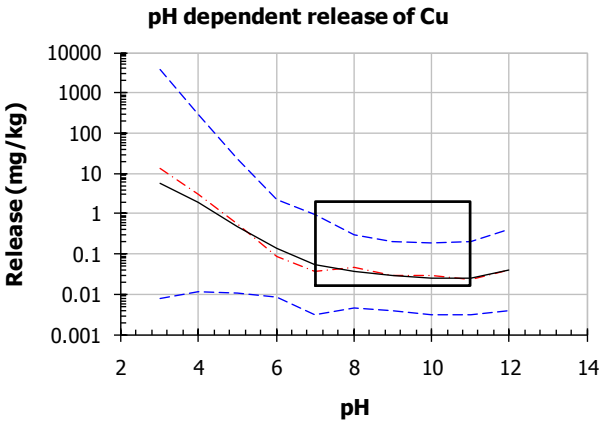

pH dependent release of P
Release (mg/kg)
10000
1000
100
10
1
0.1
0.01
0.001
0.0001
2 4 6 8 10 12 14
pH

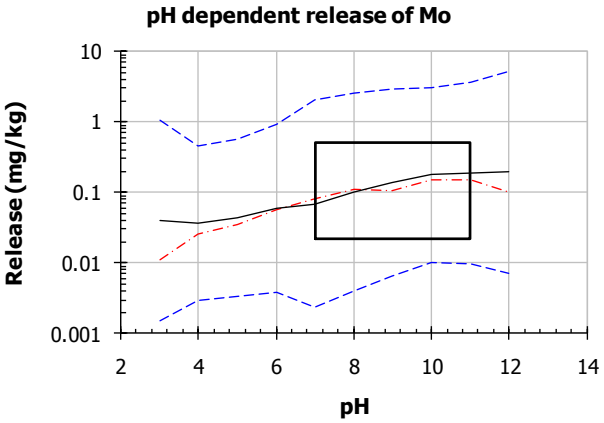

pH dependent release of Sr
Release (mg/kg)
1000
100
10
1
0.1
0.01
2 4 6 8 10 12 14
pH

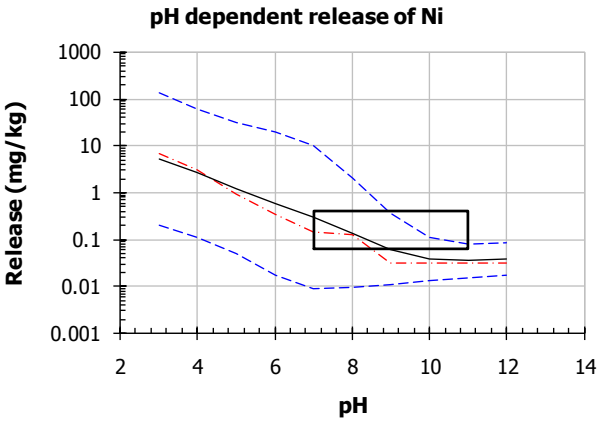

pH dependent release of As
Release (mg/kg)
100
10
1
0.1
0.01
0.001
2 4 6 8 10 12 14
pH

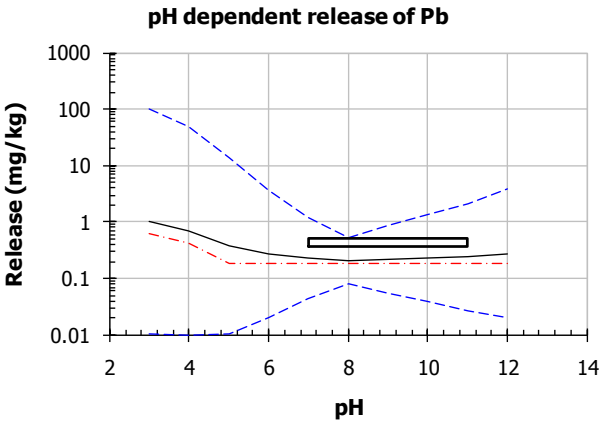

pH dependent release of Cd
Release (mg/kg)
10
1
0.1
0.01
0.001
0.0001
0.00001
2 4 6 8 10 12 14
pH

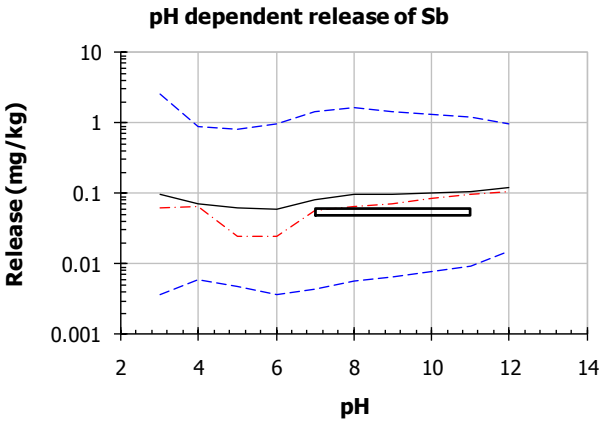

pH dependent release of Cr
Release (mg/kg)
100
10
1
0.1
0.01
0.001
0.0001
2 4 6 8 10 12 14
pH

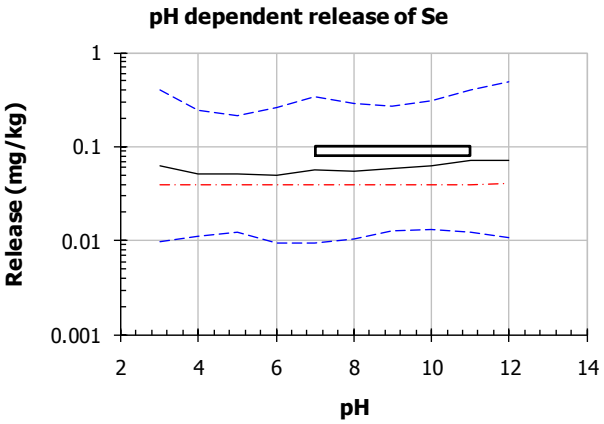

pH dependent release of Cu
Release (mg/kg)
10000
1000
100
10
1
0.1
0.01
0.001
2 4 6 8 10 12 14
pH

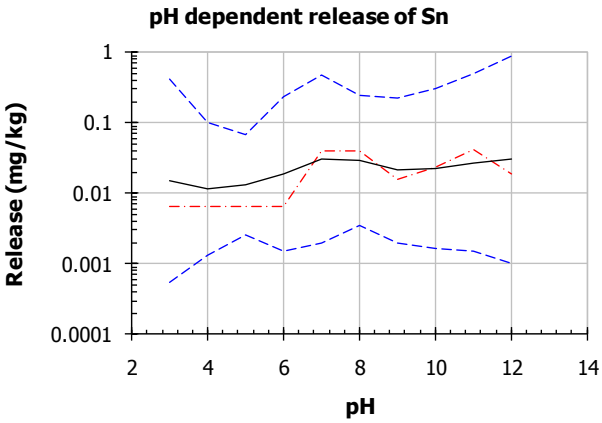

pH dependent release of Mo
Release (mg/kg)
10
1
0.1
0.01
0.001
2
4
6
8
10
12
14
pH

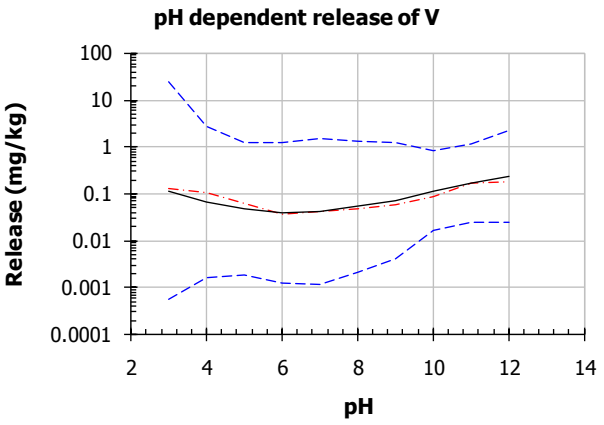

pH dependent release of Ni
Release (mg/kg)
1000
100
10
1
0.1
0.01
0.001
2
4
6
8
10
12
14
pH

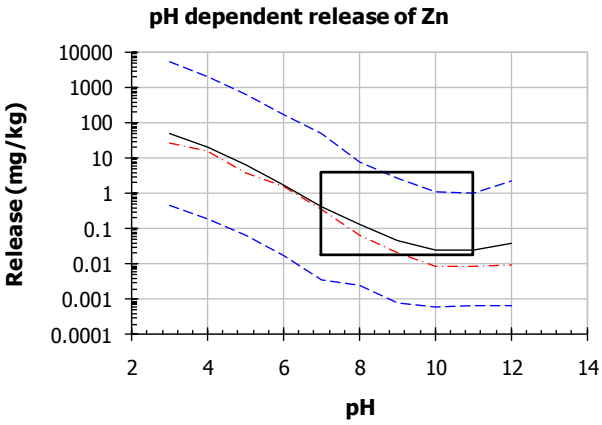

pH dependent release of Pb
Release (mg/kg)
1000
100
10
1
0.1
0.01
2
4
6
8
10
12
14
pH


pH dependent release of Sb
Release (mg/kg)
10
1
0.1
0.01
0.001
2
4
6
8
10
12
14
pH

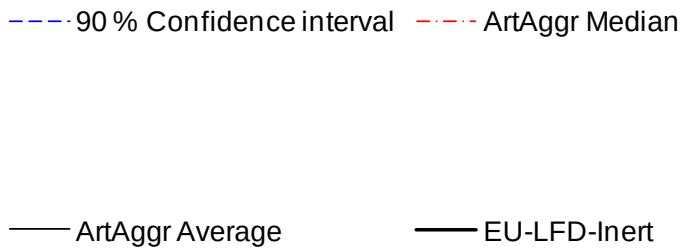

pH dependent release of Se
Release (mg/kg)
1
0.1
0.01
0.001
2
4
6
8
10
12
14
pH


pH dependent release of Sn
Release (mg/kg)
1
0.1
0.01
0.001
0.0001
2
4
6
8
10
12
14
pH


pH dependent release of V
Release (mg/kg)
100
10
1
0.1
0.01
0.001
0.0001
2
4
6
8
10
12
14
pH

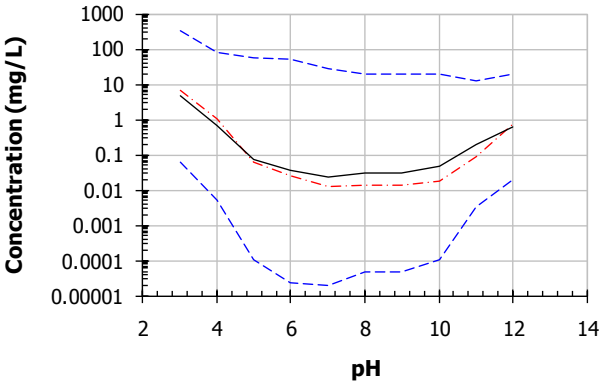

pH dependent release of Zn
Release (mg/kg)
10000
1000
100
10
1
0.1
0.01
0.001
0.0001
2
4
6
8
10
12
14
pH

Legend

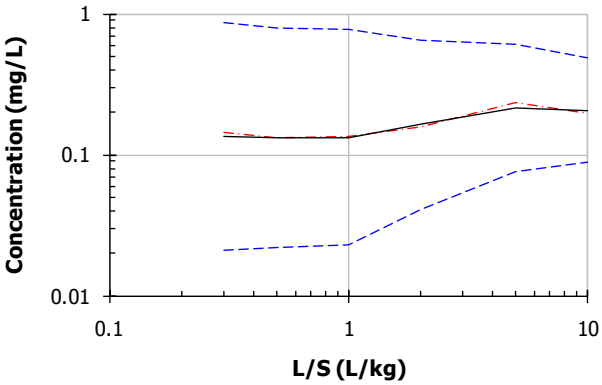


Box in pH dependence plot shows regulatory level (EU LFD Inert), relevant pH domain and detection limit.

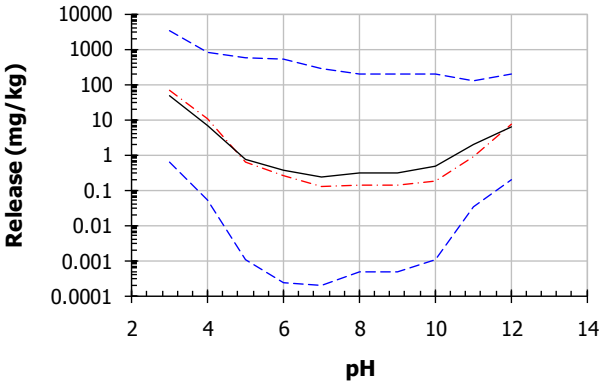
pH dependent concentration of Al



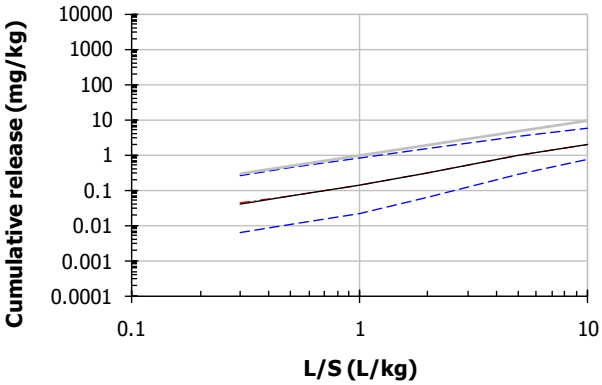
Al concentration as function of L/S



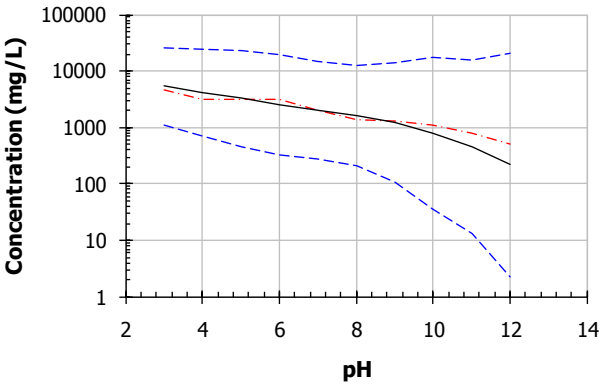
pH dependent release of Al



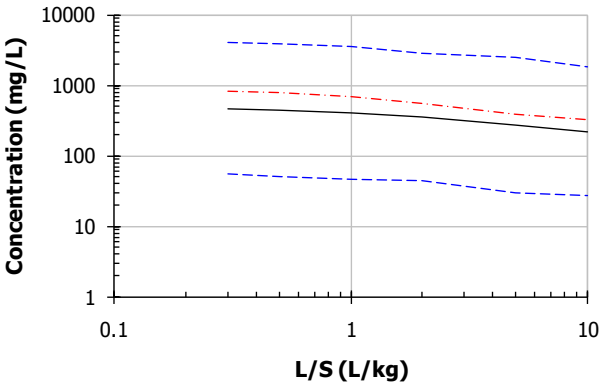
Cumulative release of Al



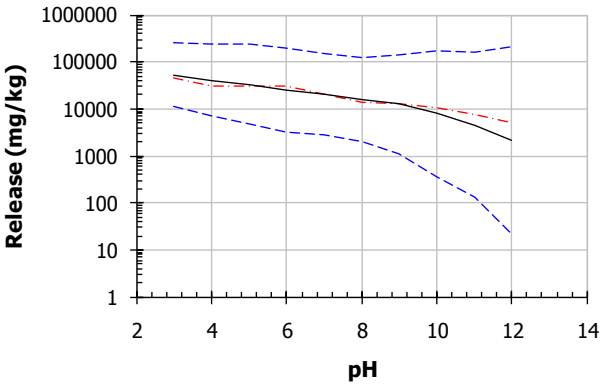
pH dependent concentration of Ca



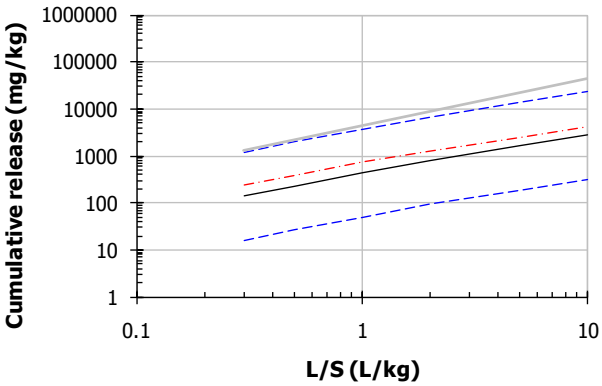
Ca concentration as function of L/S



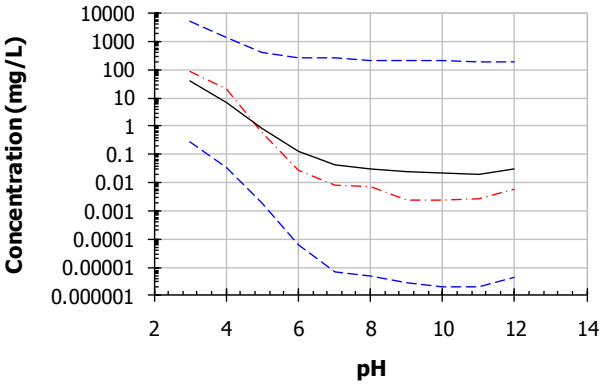
pH dependent release of Ca



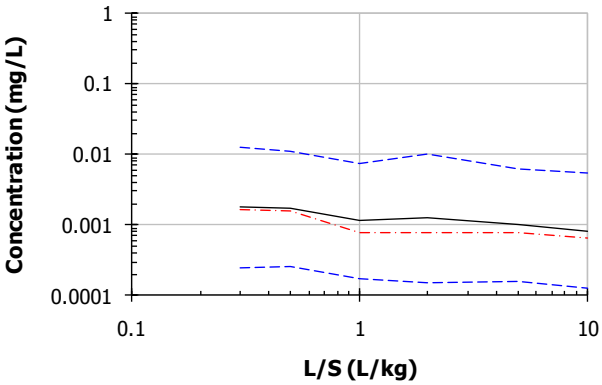
Cumulative release of Ca



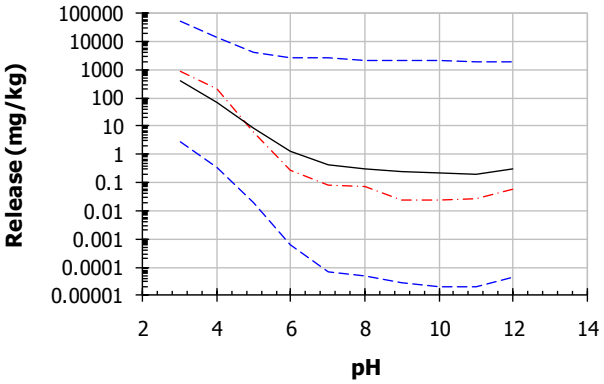
pH dependent concentration of Fe



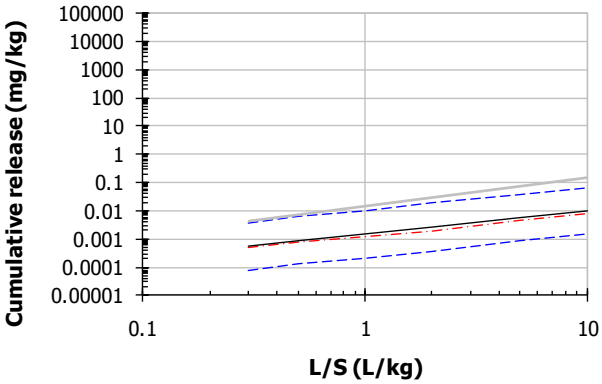
Fe concentration as function of L/S



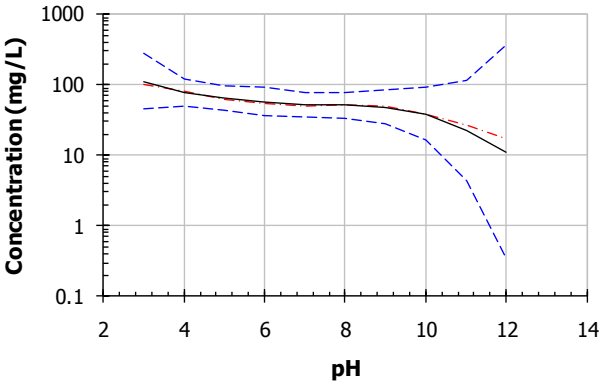
pH dependent release of Fe



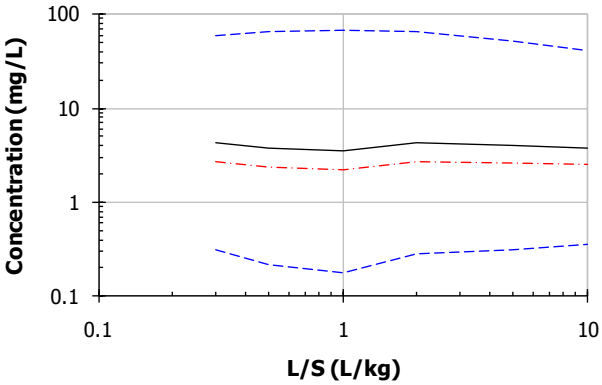
Cumulative release of Fe



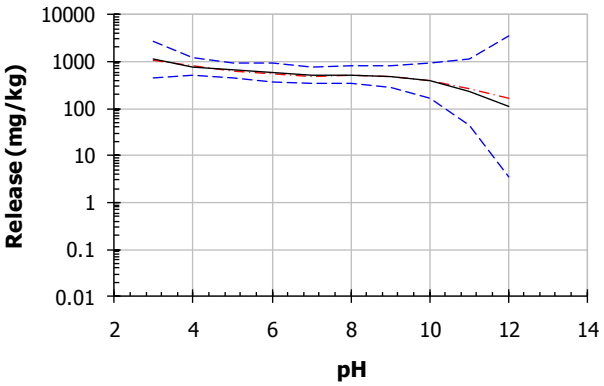
pH dependent concentration of Si



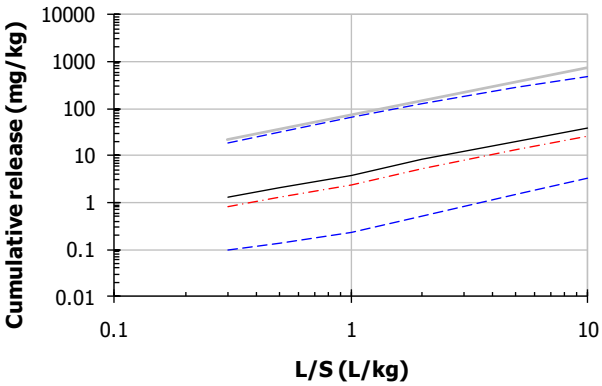
Si concentration as function of L/S



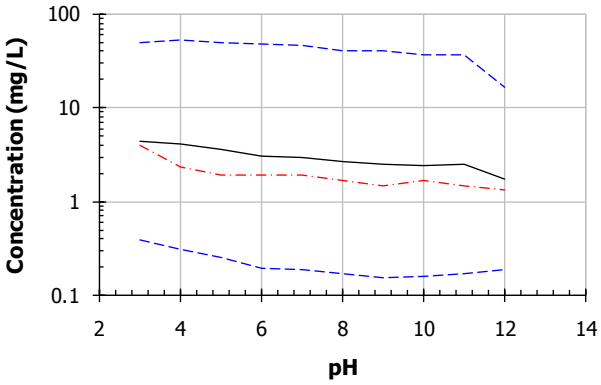
pH dependent release of Si



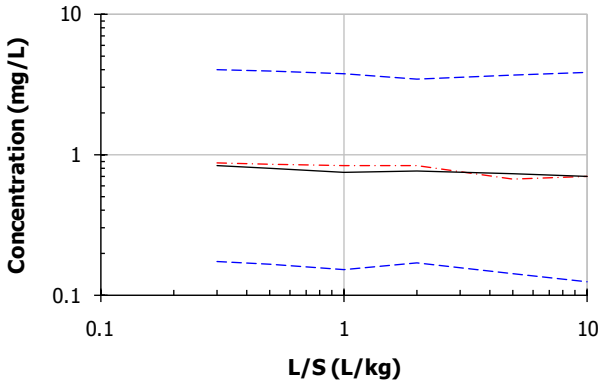
Cumulative release of Si



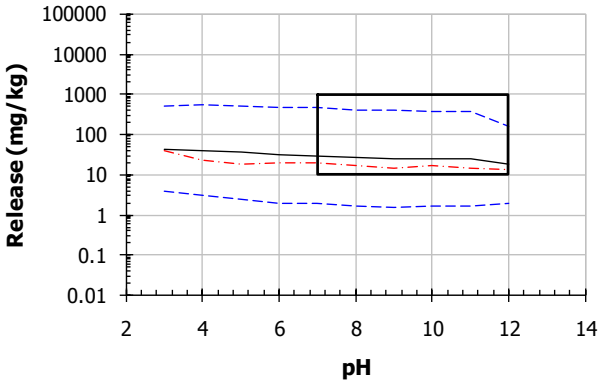
pH dependent concentration of SO4



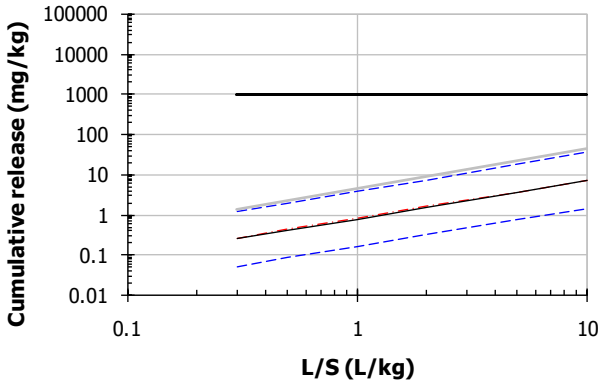
SO4 concentration as function of L/S



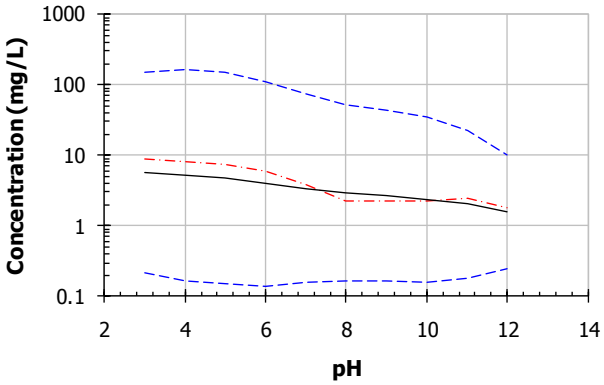
pH dependent release of SO4



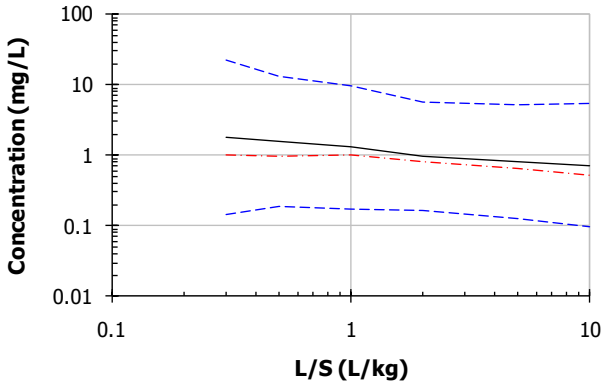
Cumulative release of SO4



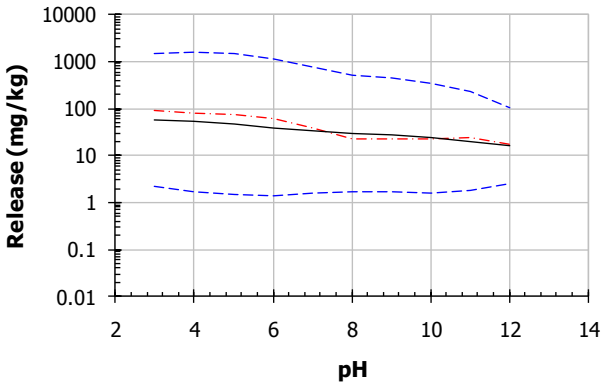
pH dependent concentration of S



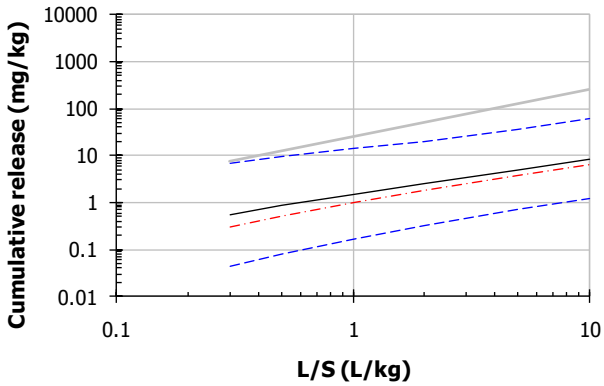
S concentration as function of L/S



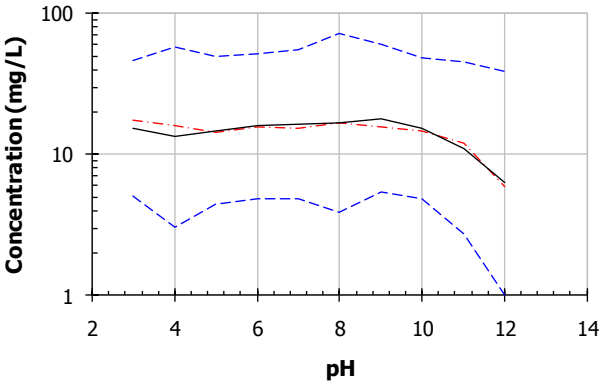
pH dependent release of S



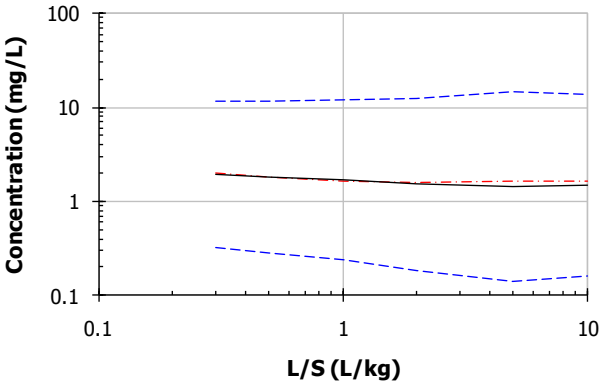
Cumulative release of S



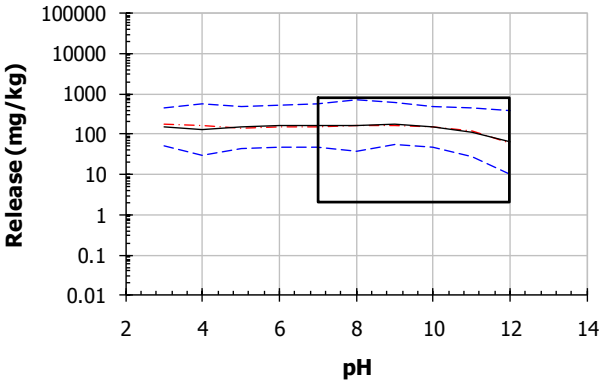
pH dependent concentration of Cl



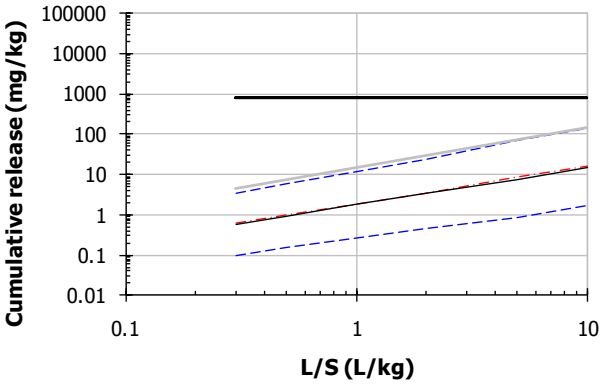
Cl concentration as function of L/S



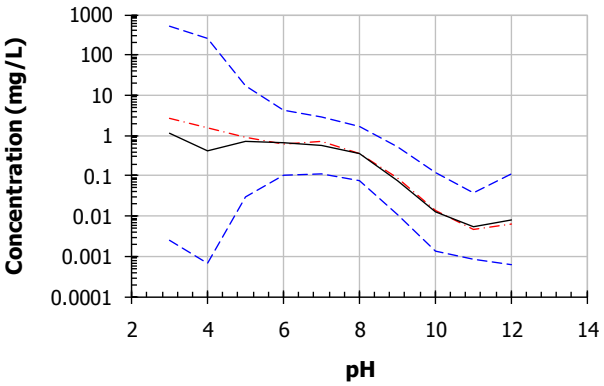
pH dependent release of Cl



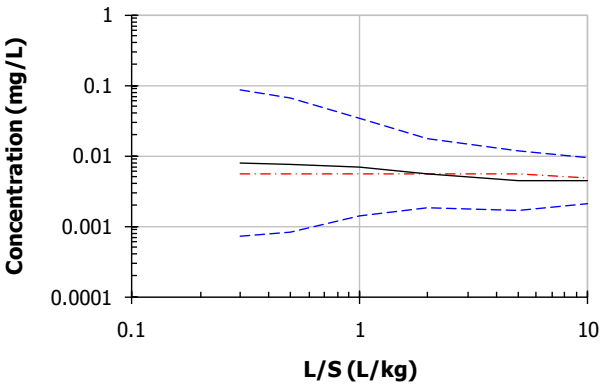
Cumulative release of Cl



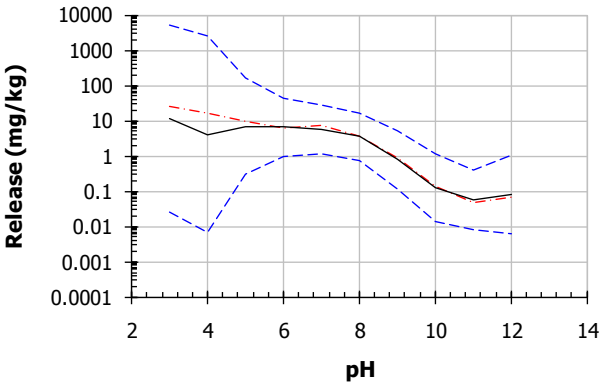
pH dependent concentration of P



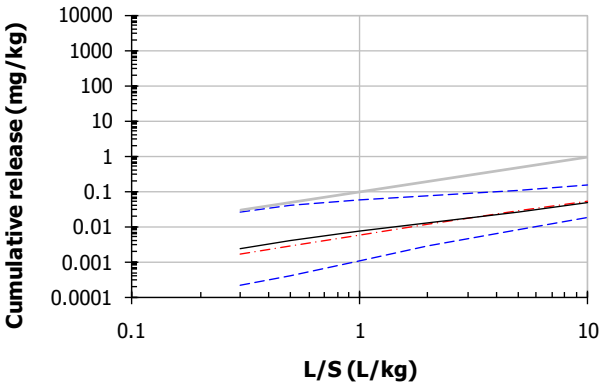
P concentration as function of L/S



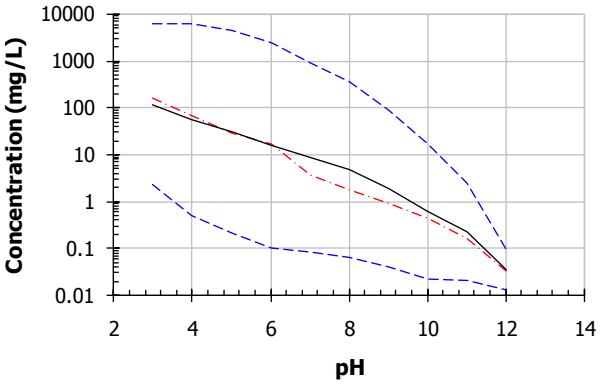
pH dependent release of P



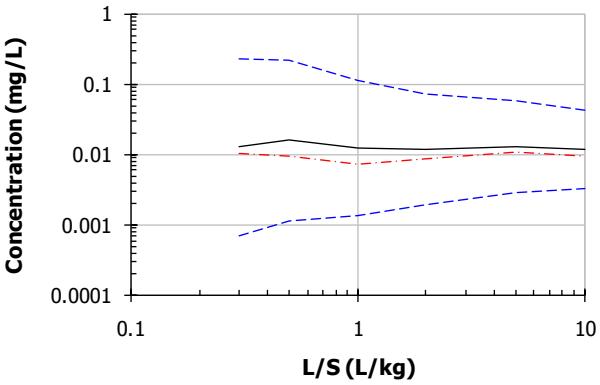
Cumulative release of P



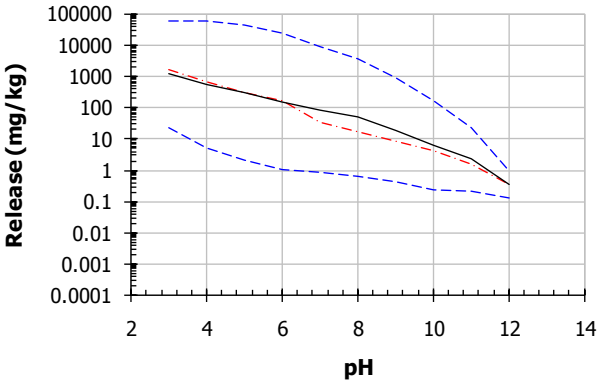
pH dependent concentration of Mg



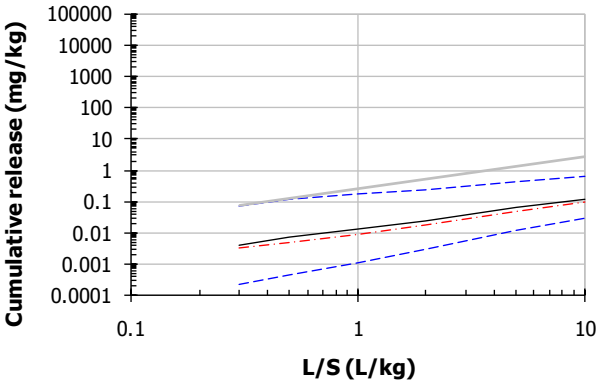
Mg concentration as function of L/S



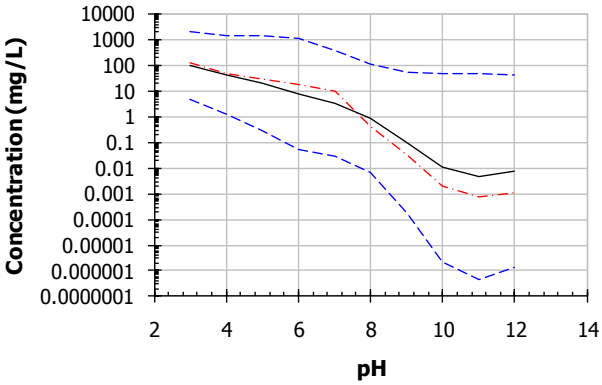
pH dependent release of Mg



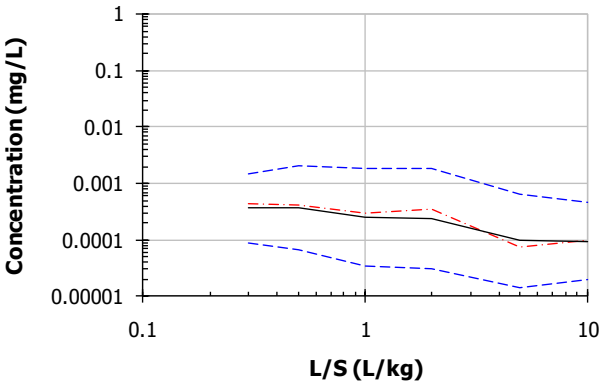
Cumulative release of Mg



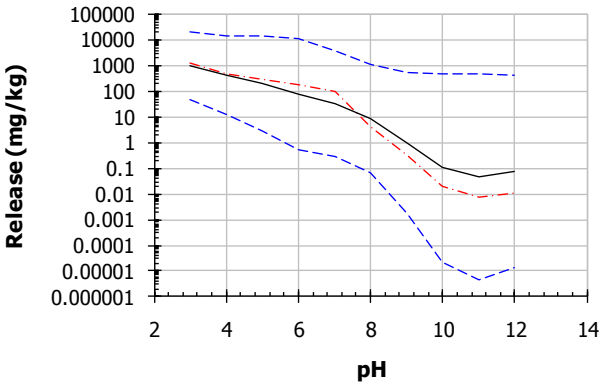
pH dependent concentration of Mn



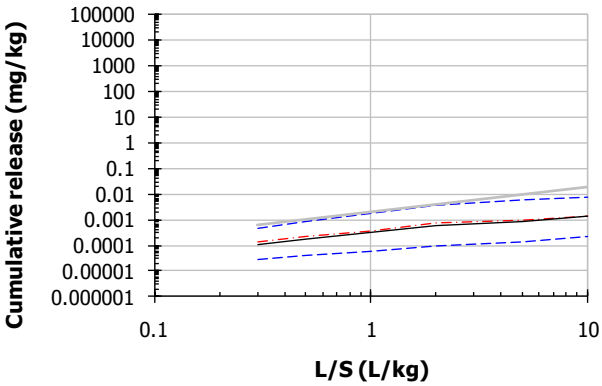
Mn concentration as function of L/S



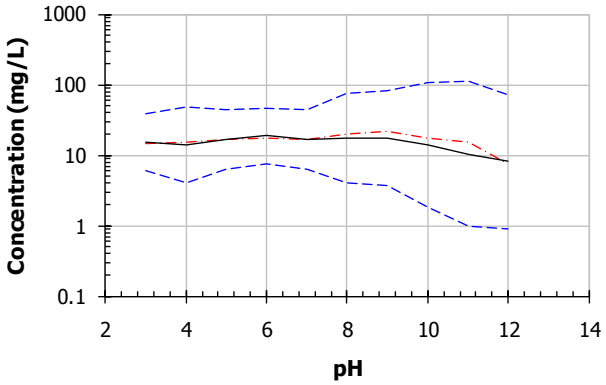
pH dependent release of Mn



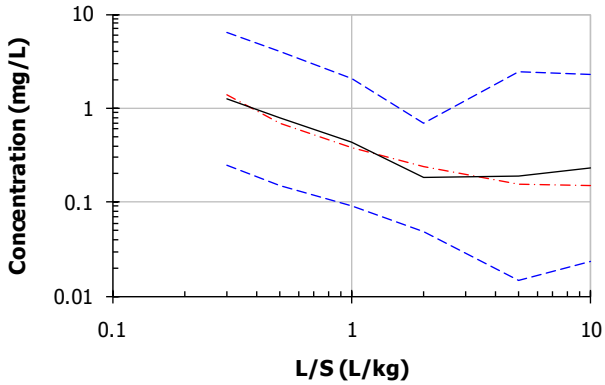
Cumulative release of Mn



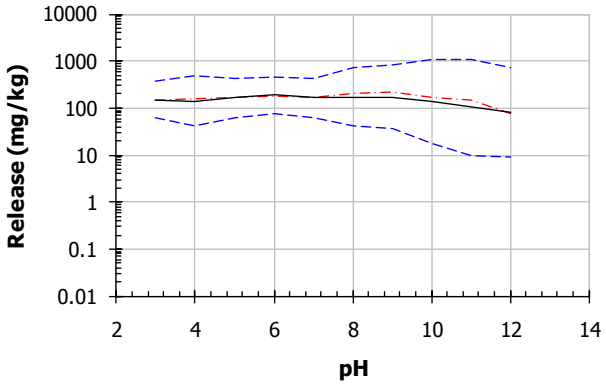
pH dependent concentration of K



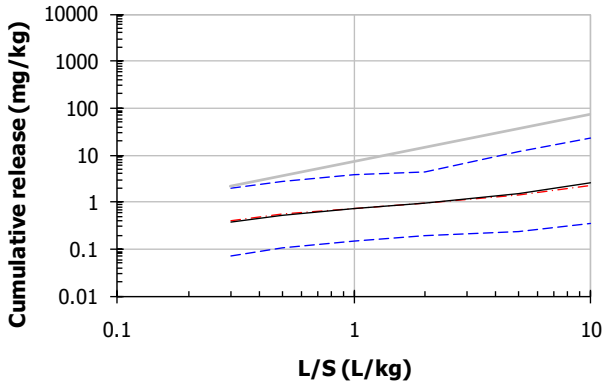
K concentration as function of L/S



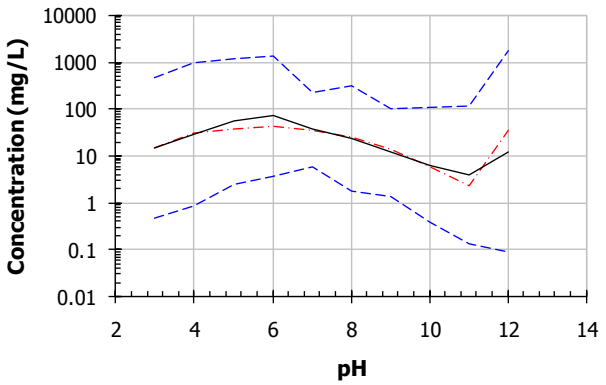
pH dependent release of K



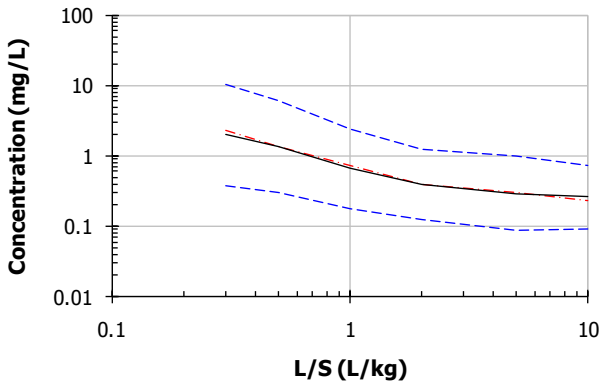
Cumulative release of K



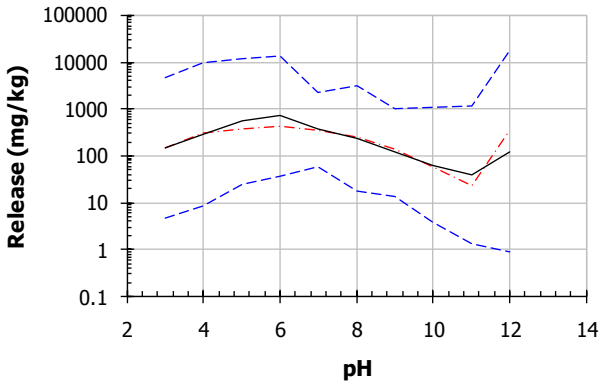
pH dependent concentration of Na



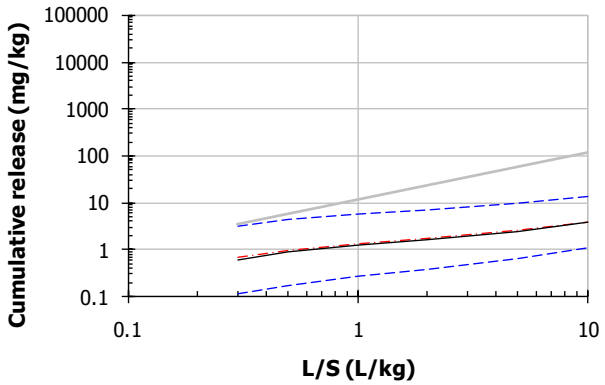
Na concentration as function of L/S



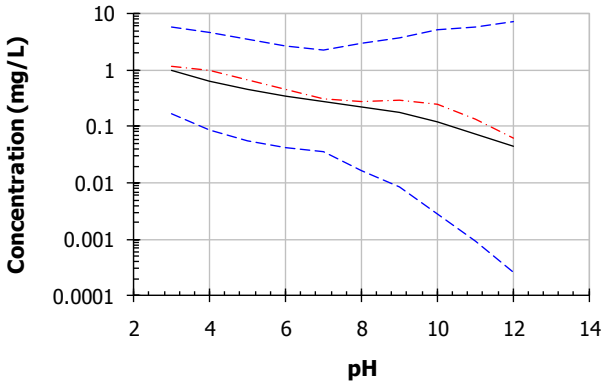
pH dependent release of Na



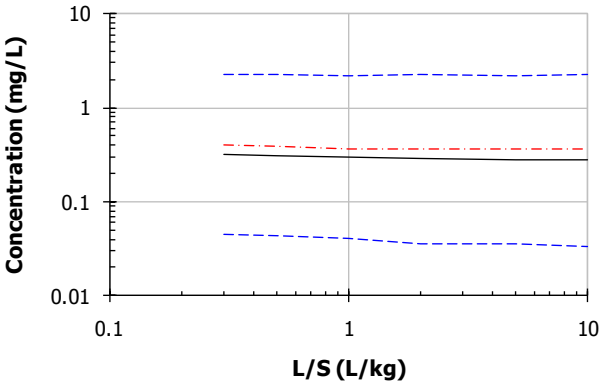
Cumulative release of Na



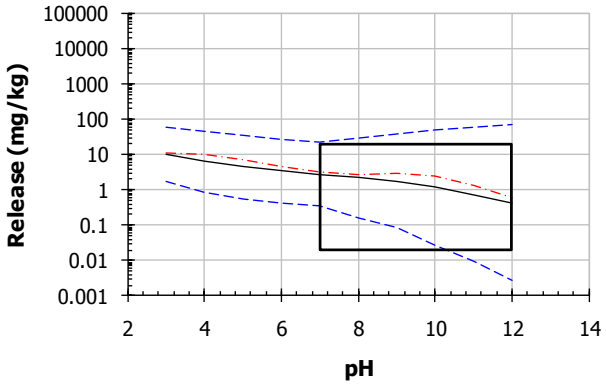
pH dependent concentration of Ba



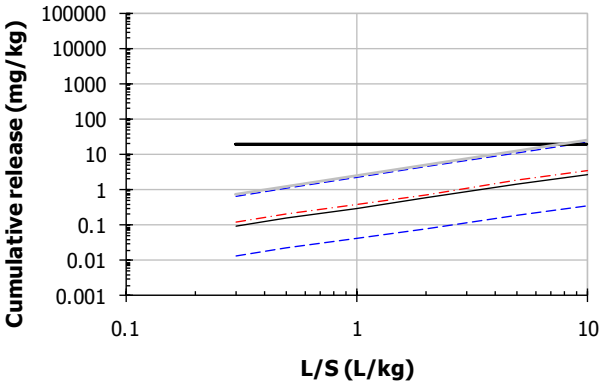
Ba concentration as function of L/S



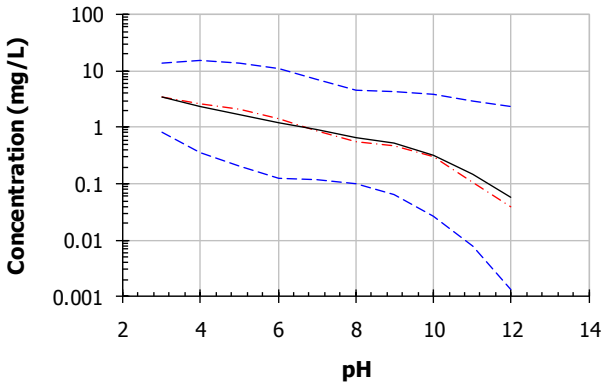
pH dependent release of Ba



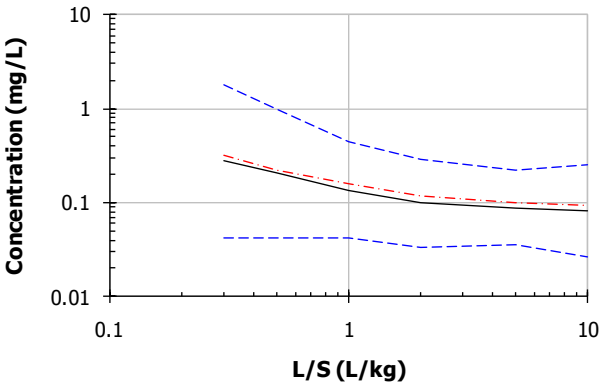
Cumulative release of Ba



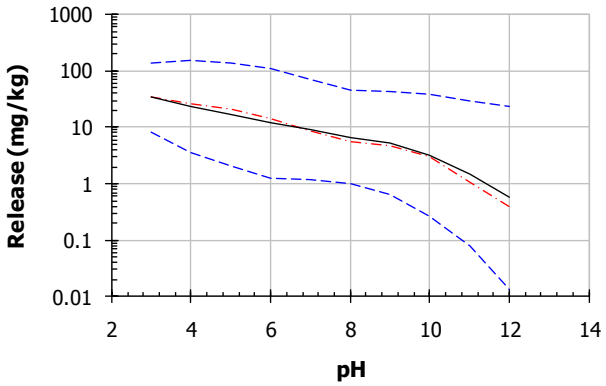
pH dependent concentration of Sr



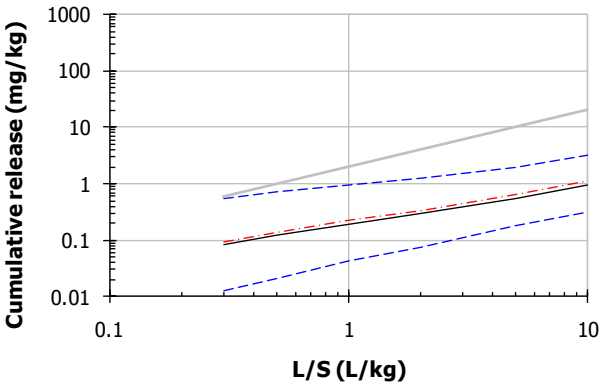
Sr concentration as function of L/S



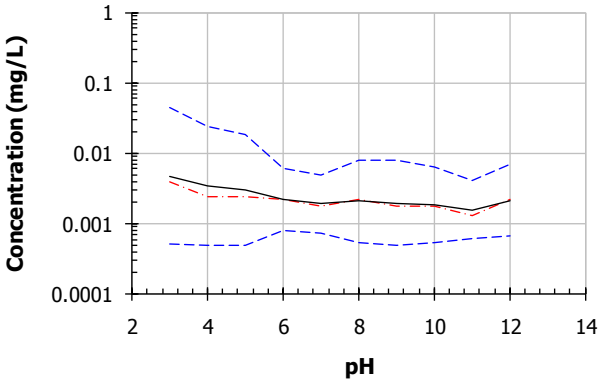
pH dependent release of Sr



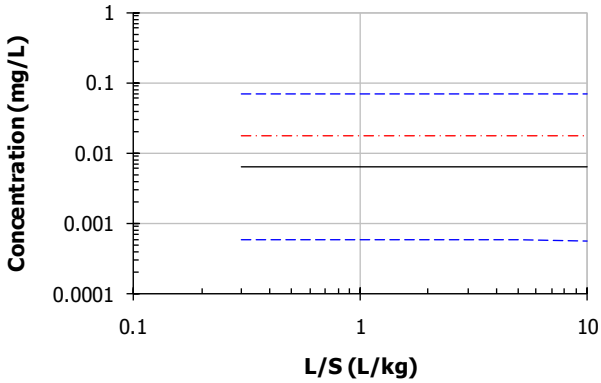
Cumulative release of Sr



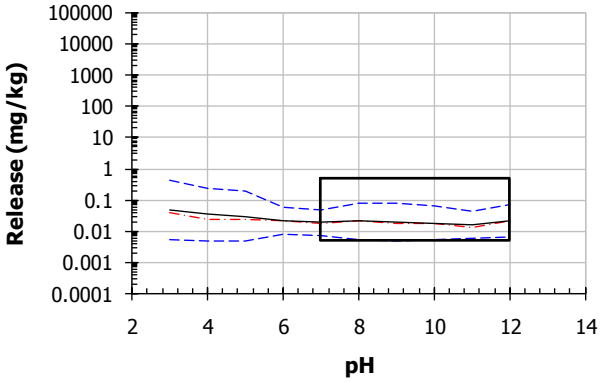
pH dependent concentration of As



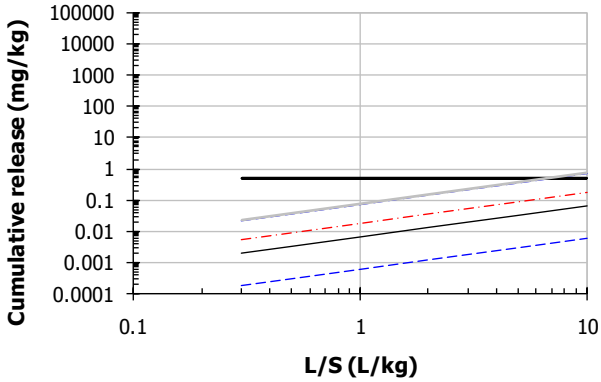
As concentration as function of L/S



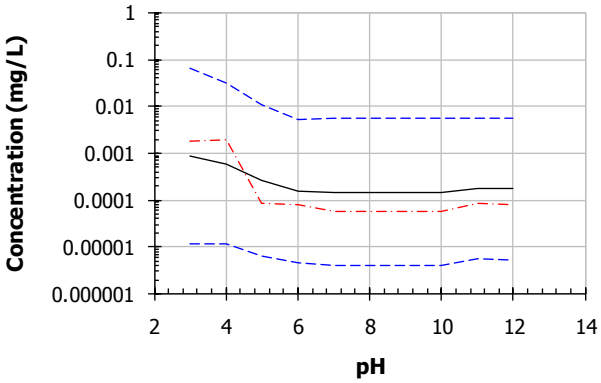
pH dependent release of As



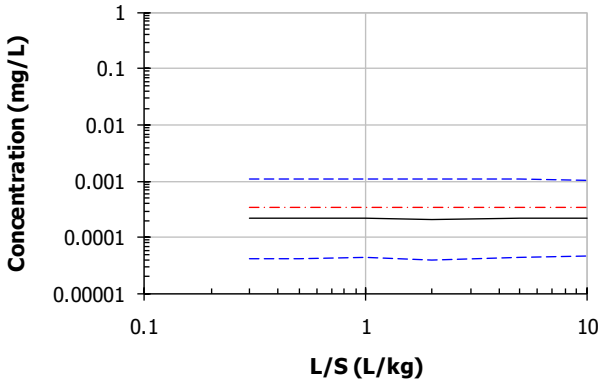
Cumulative release of As



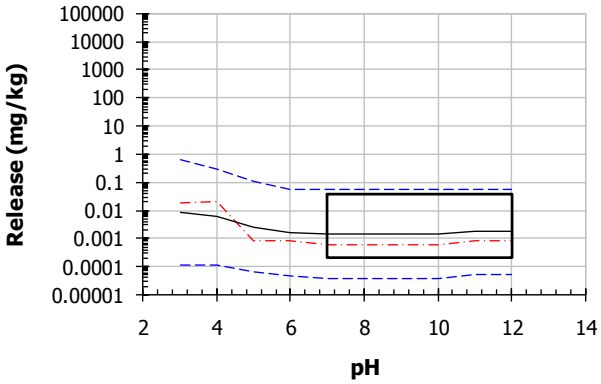
pH dependent concentration of Cd



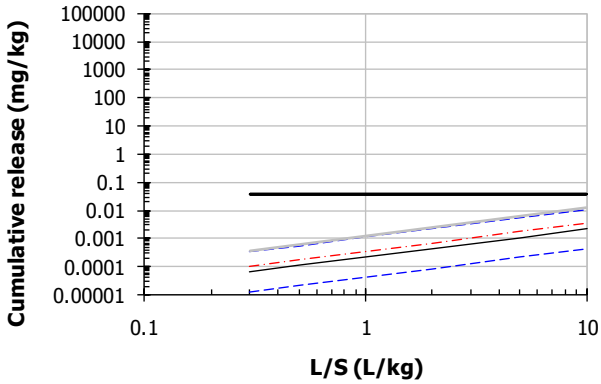
Cd concentration as function of L/S



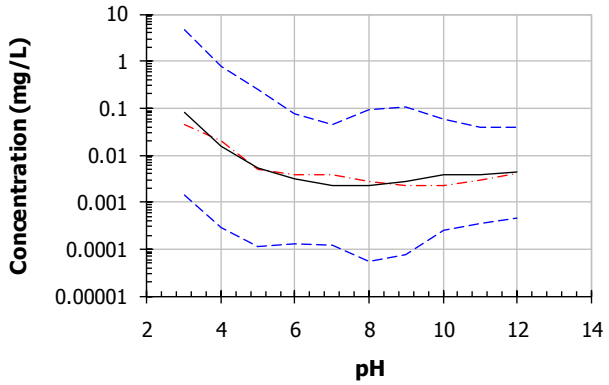
pH dependent release of Cd



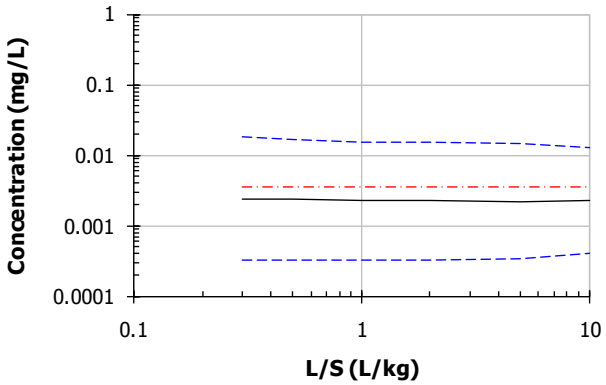
Cumulative release of Cd



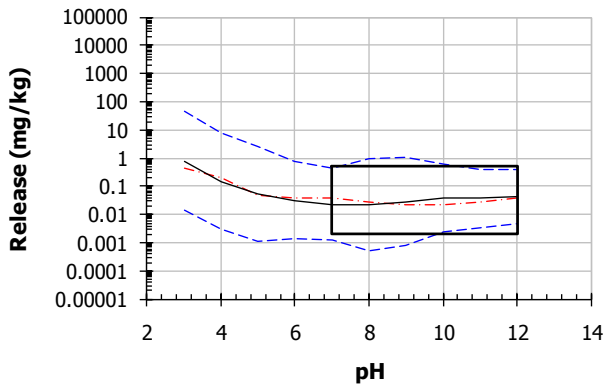
pH dependent concentration of Cr



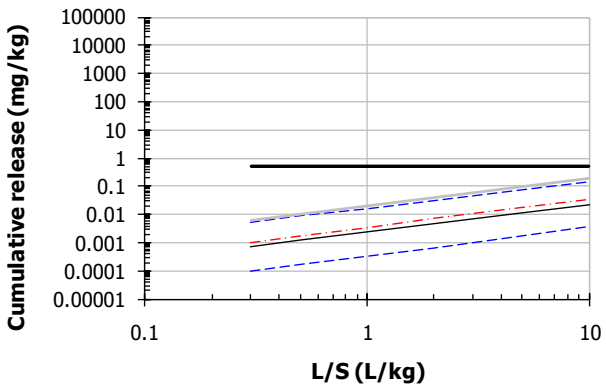
Cr concentration as function of L/S



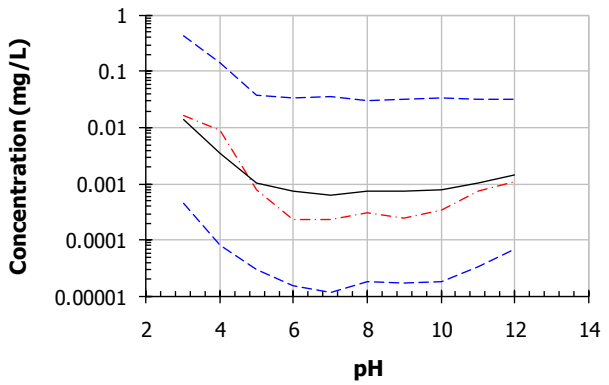
pH dependent release of Cr



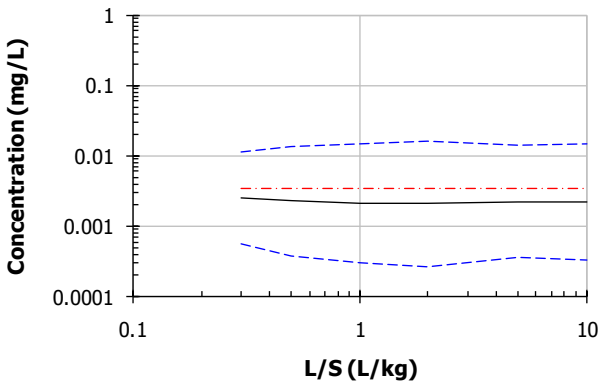
Cumulative release of Cr



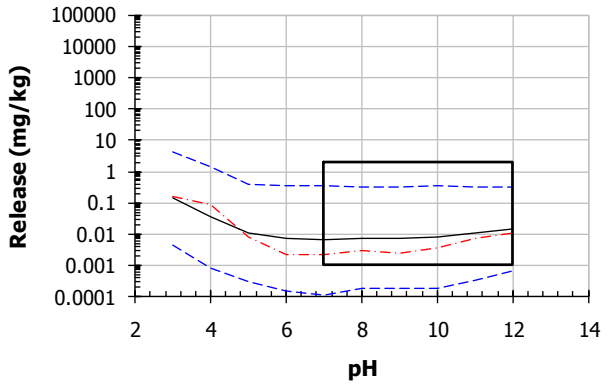
pH dependent concentration of Cu



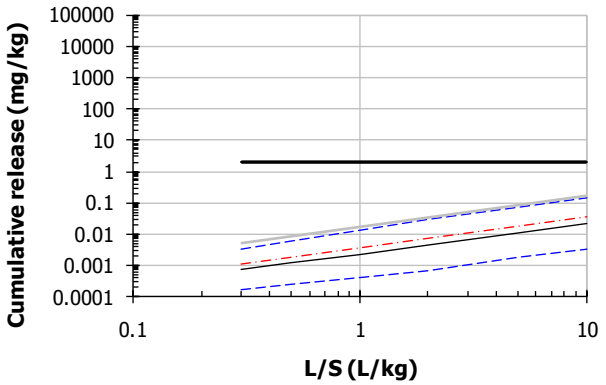
Cu concentration as function of L/S



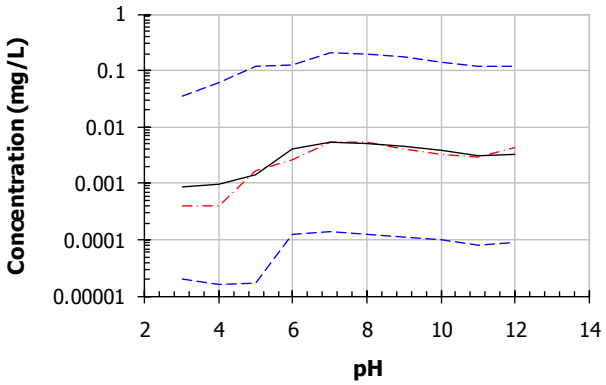
pH dependent release of Cu



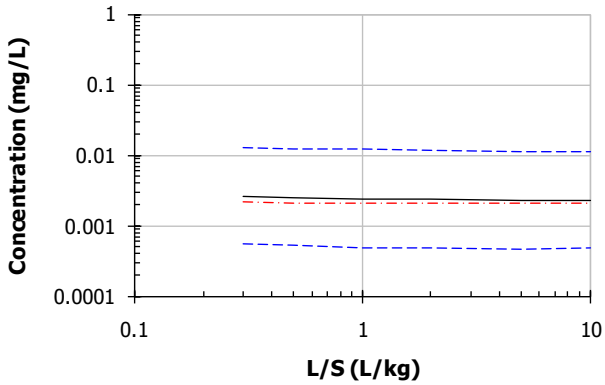
Cumulative release of Cu



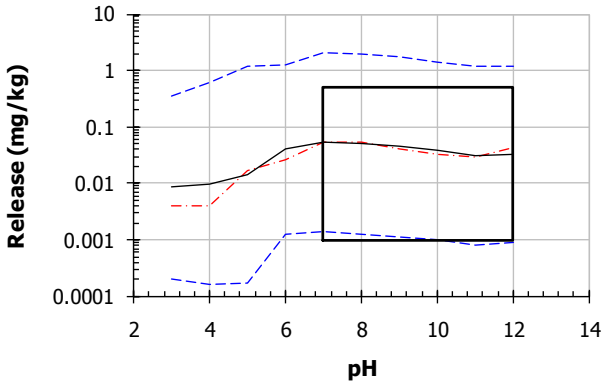
pH dependent concentration of Mo



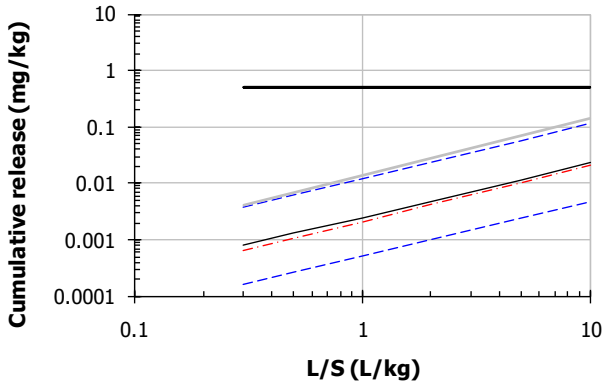
Mo concentration as function of L/S



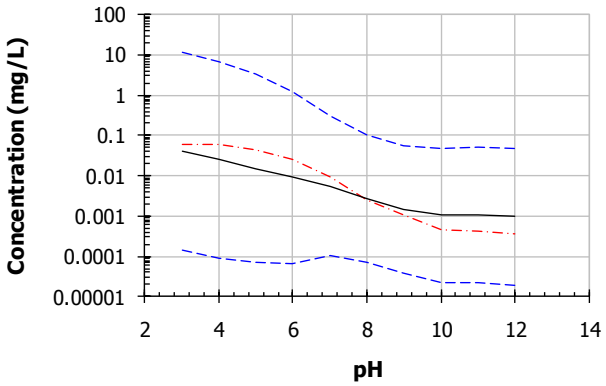
pH dependent release of Mo



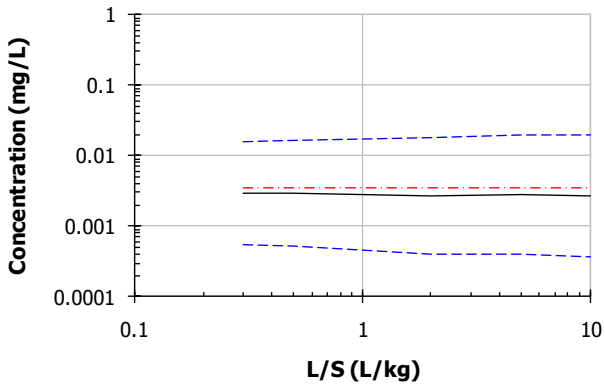
Cumulative release of Mo



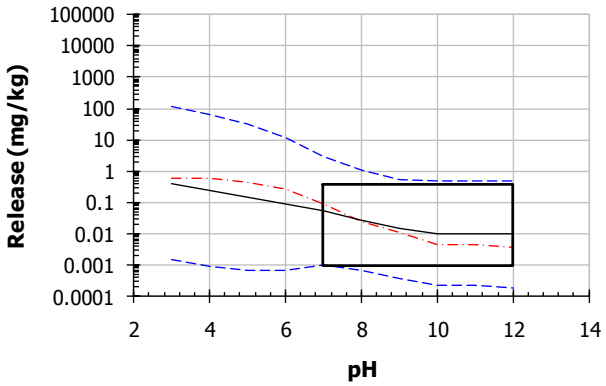
pH dependent concentration of Ni



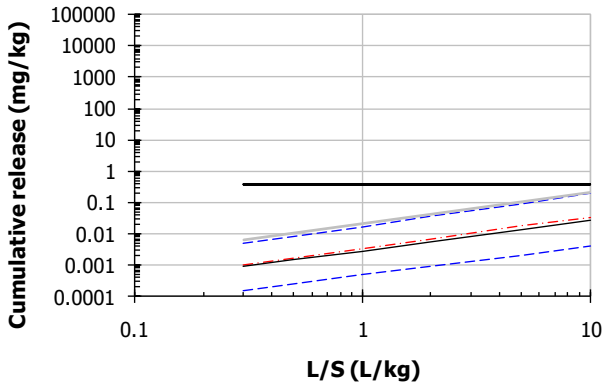
Ni concentration as function of L/S



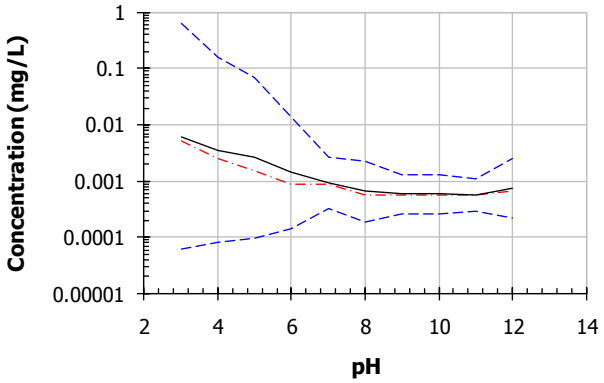
pH dependent release of Ni



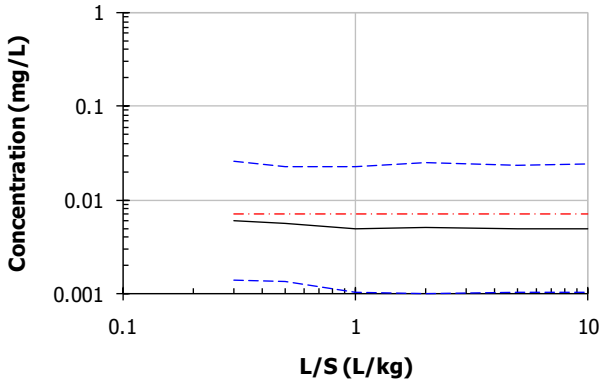
Cumulative release of Ni



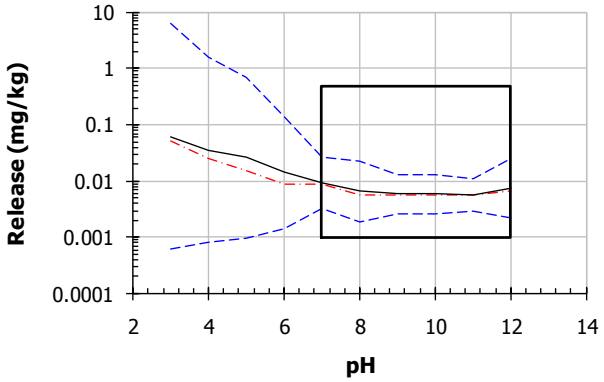
pH dependent concentration of Pb



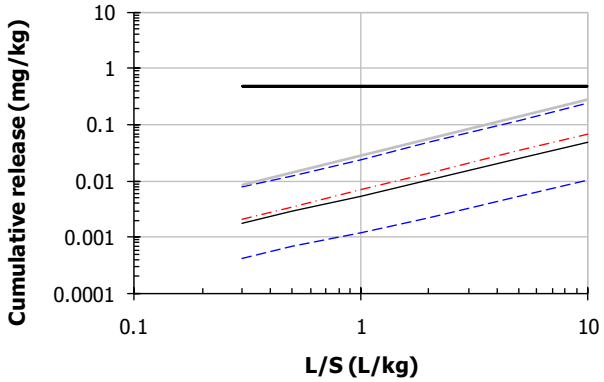
Pb concentration as function of L/S



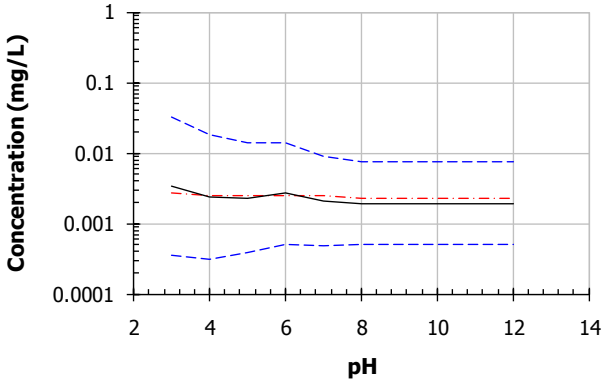
pH dependent release of Pb



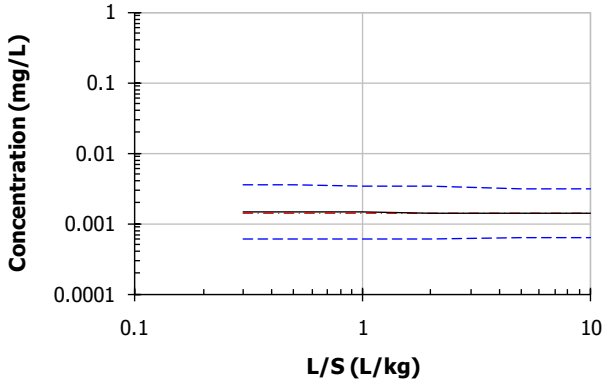
Cumulative release of Pb



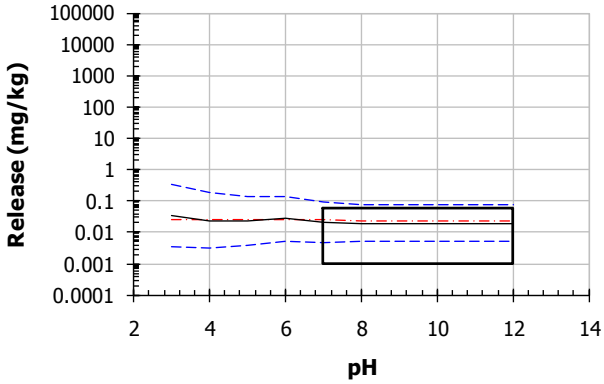
pH dependent concentration of Sb



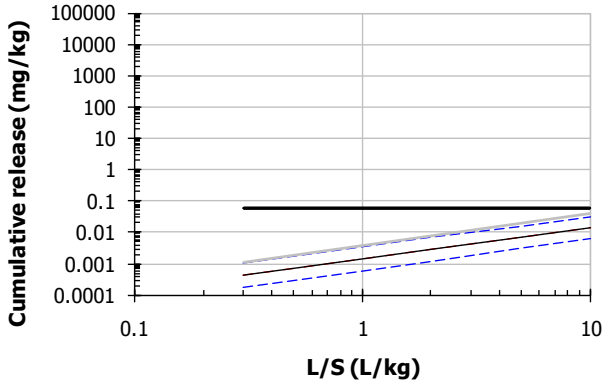
Sb concentration as function of L/S



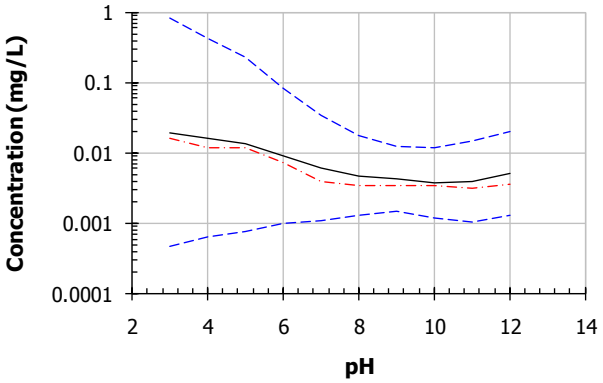
pH dependent release of Sb



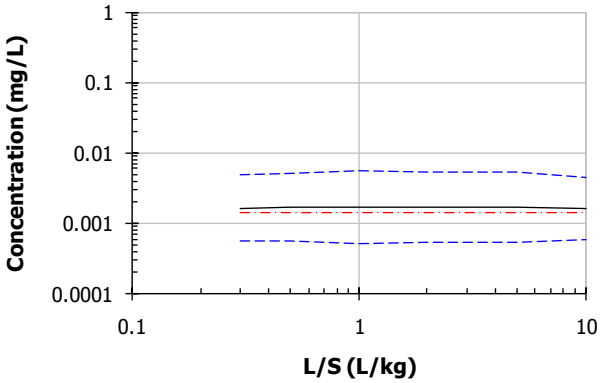
Cumulative release of Sb



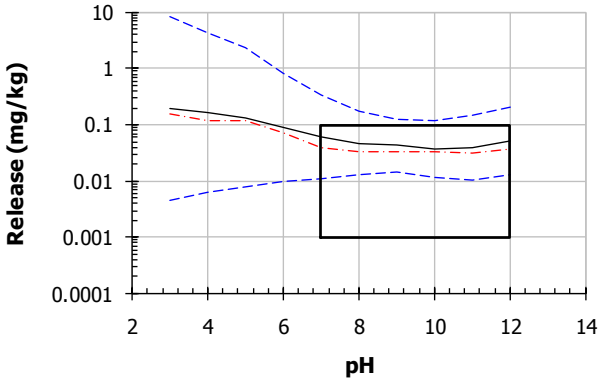
pH dependent concentration of Se



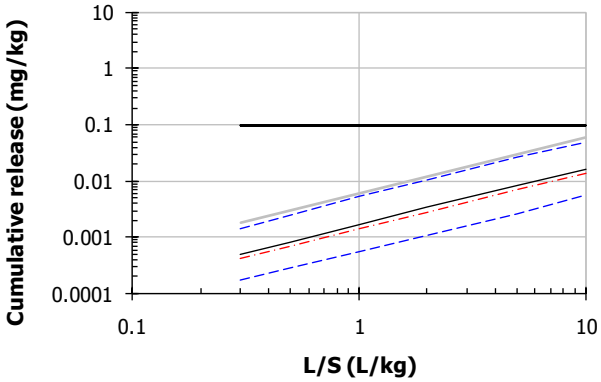
Se concentration as function of L/S



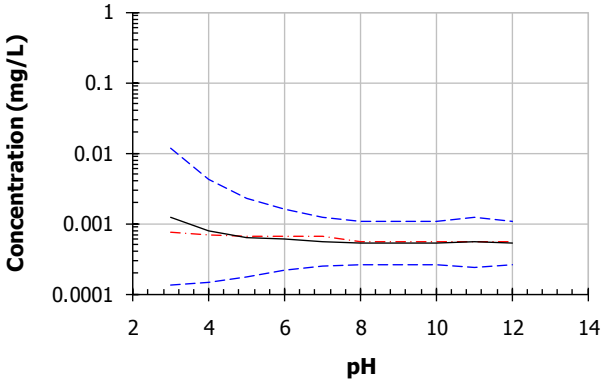
pH dependent release of Se



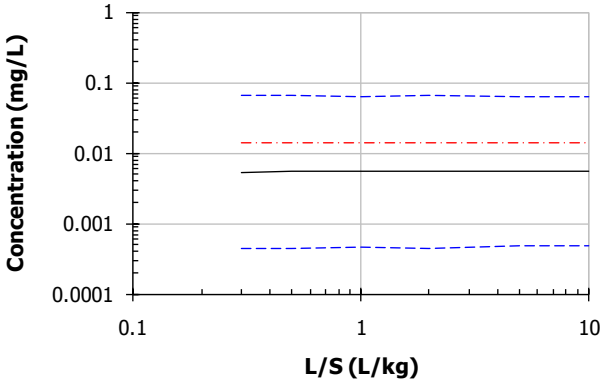
Cumulative release of Se



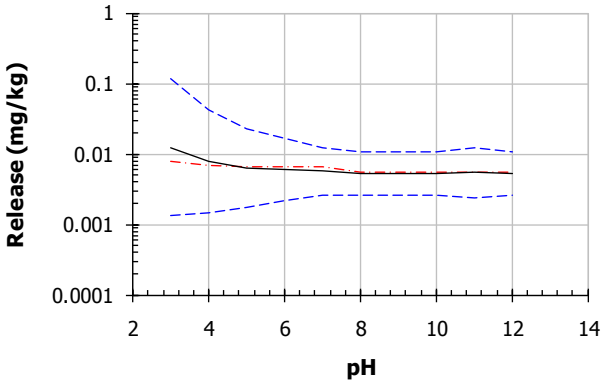
pH dependent concentration of Sn



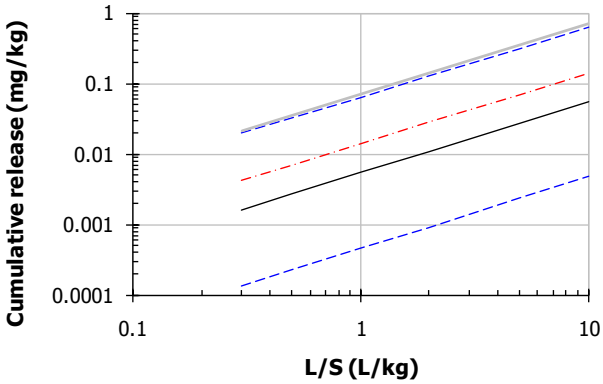
Sn concentration as function of L/S



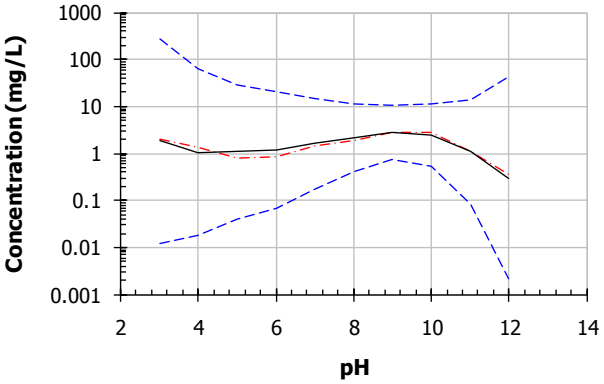
pH dependent release of Sn



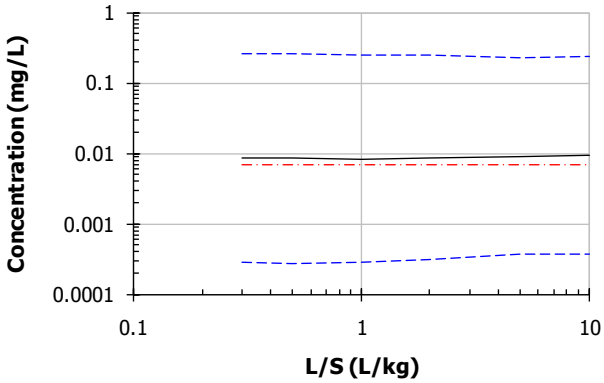
Cumulative release of Sn



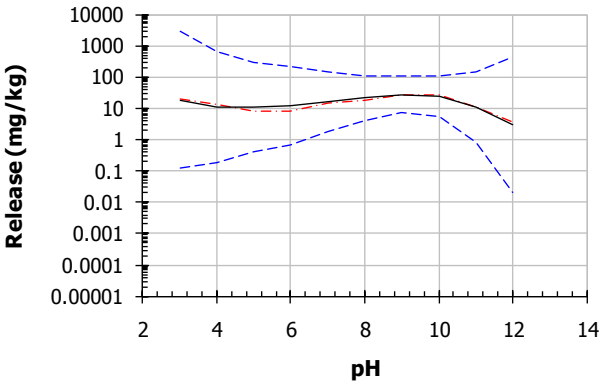
pH dependent concentration of V



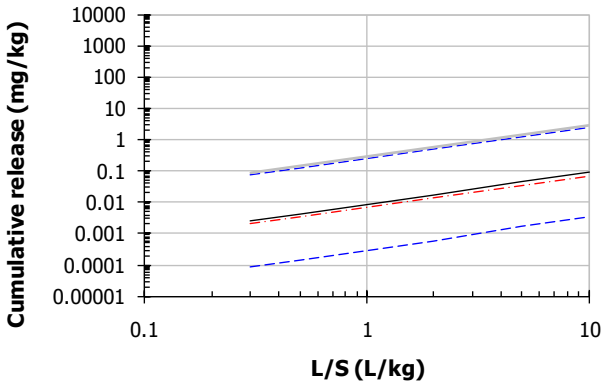
V concentration as function of L/S



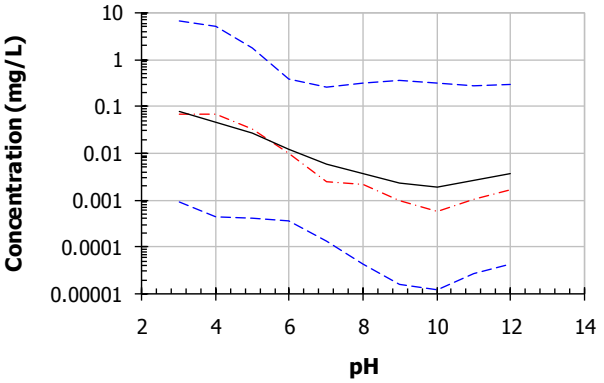
pH dependent release of V



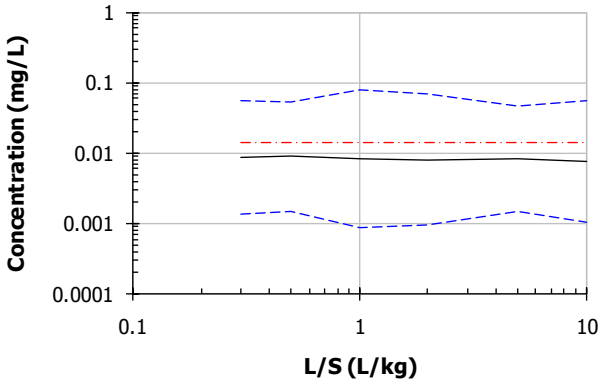
Cumulative release of V



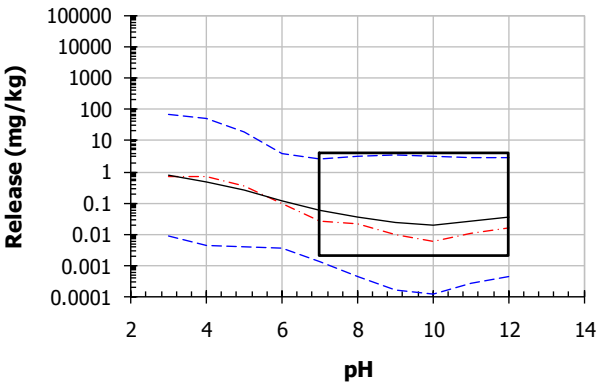
pH dependent concentration of Zn



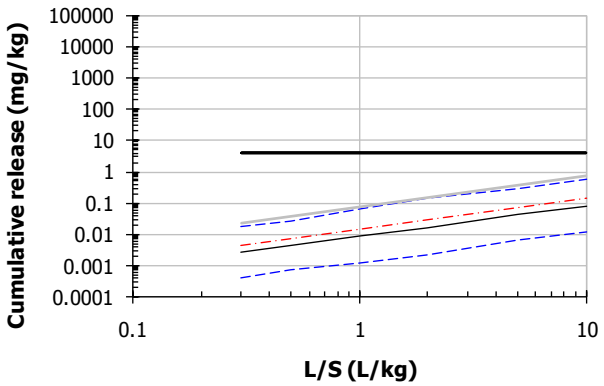
Zn concentration as function of L/S

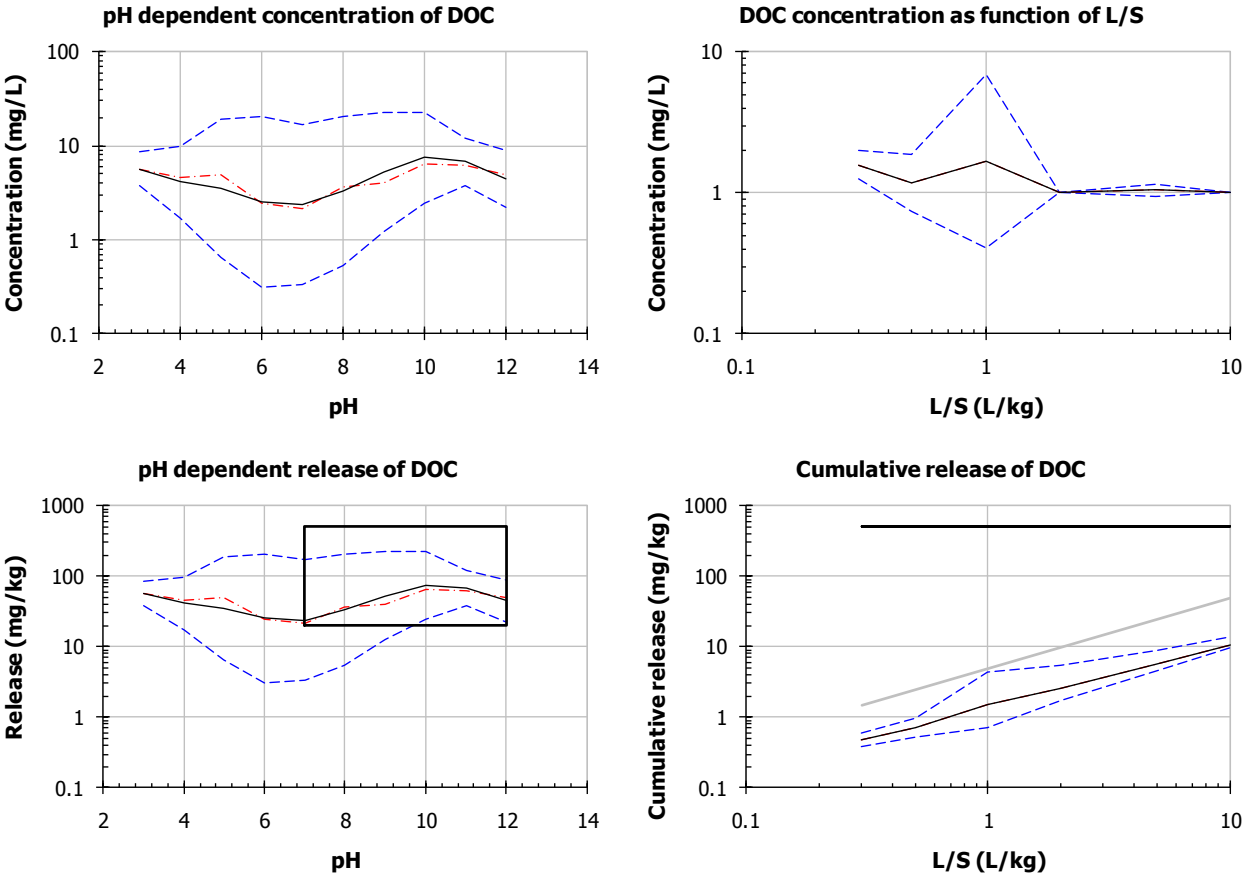


pH dependent release of Zn



Cumulative release of Zn





Legend

90 % Confidence interval

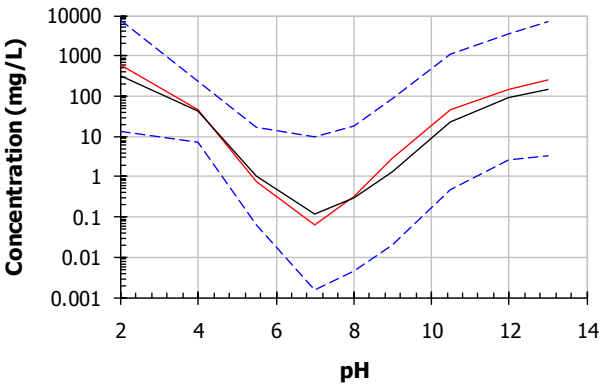
BOFslag Median

BOFslag Average

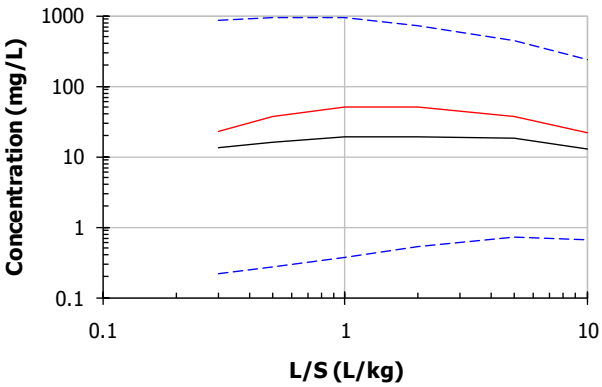
EU-LFD-Inert

Box in pH dependence plot shows regulatory level (EU LFD Inert), relevant pH domain and detection limit. The horizontal solid line in the plot as function of L/S also reflects the regulatory level.

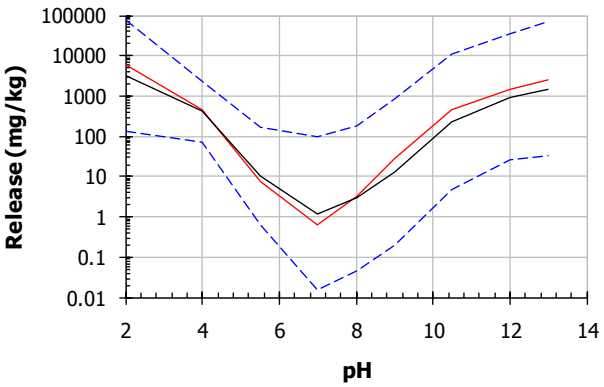
pH dependent concentration of Al



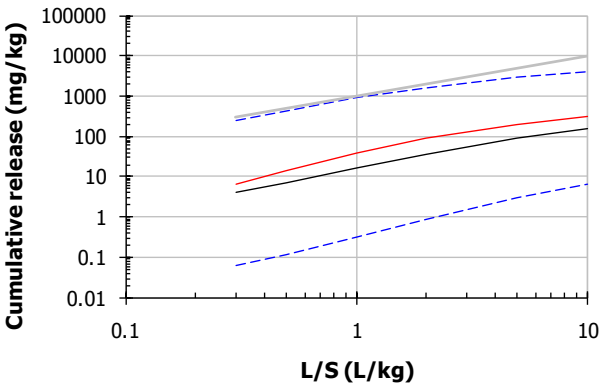
Al concentration as function of L/S



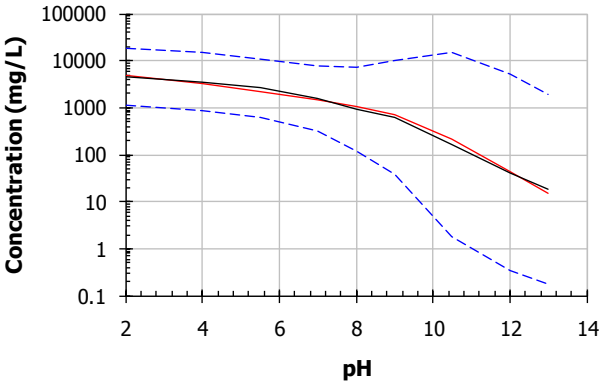
pH dependent release of Al



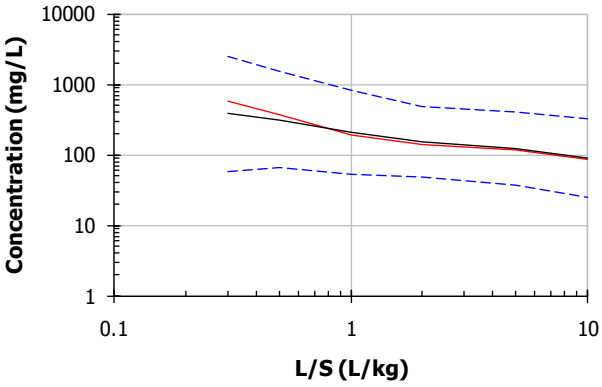
Cumulative release of Al



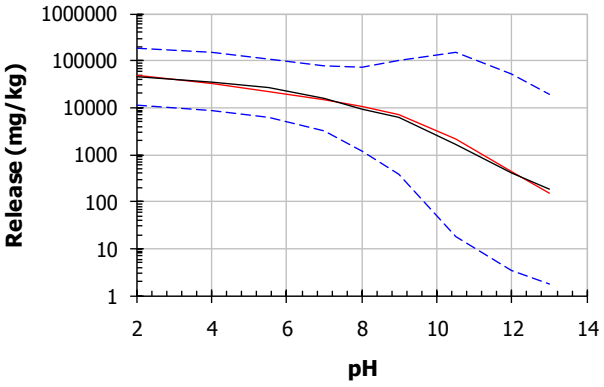
pH dependent concentration of Ca



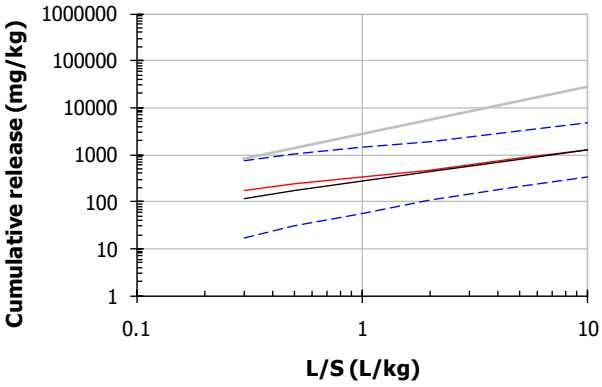
Ca concentration as function of L/S



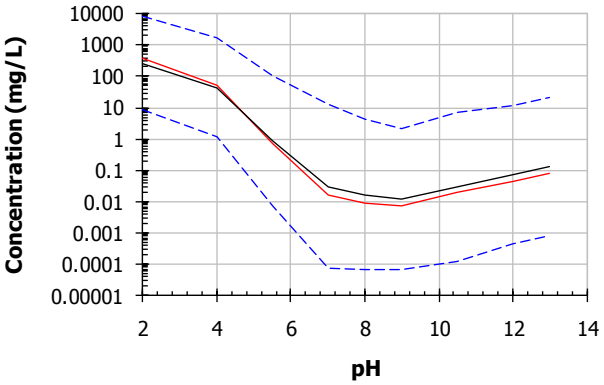
pH dependent release of Ca



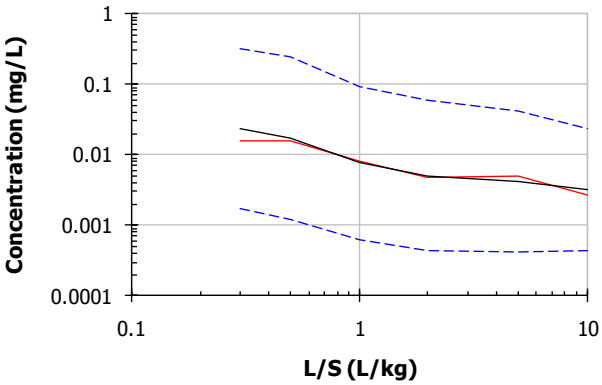
Cumulative release of Ca



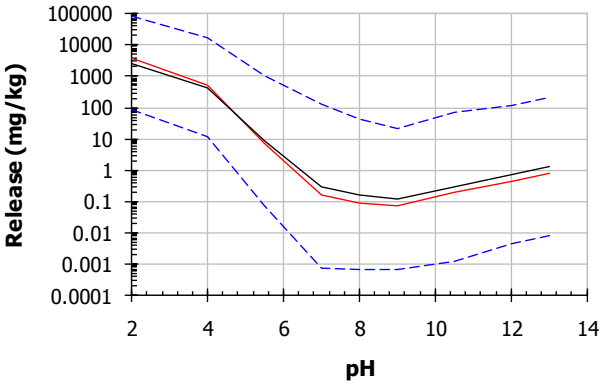
pH dependent concentration of Fe



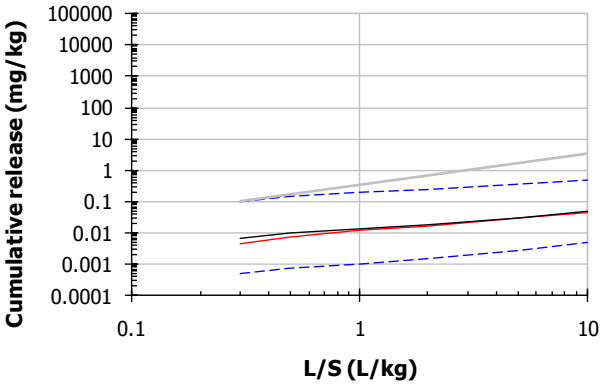
Fe concentration as function of L/S



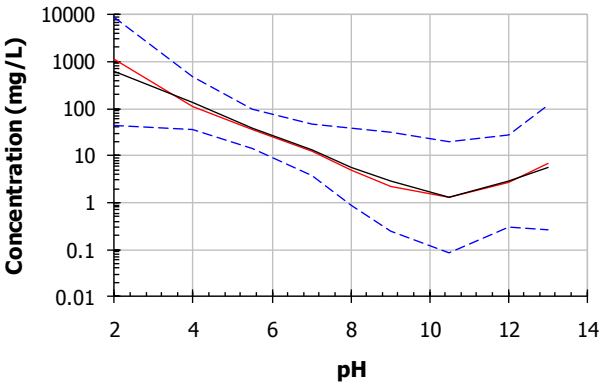
pH dependent release of Fe



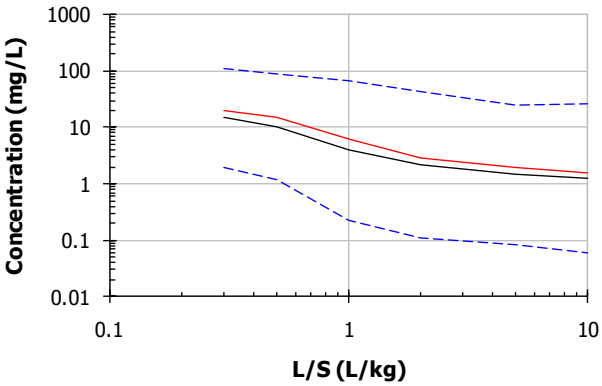
Cumulative release of Fe



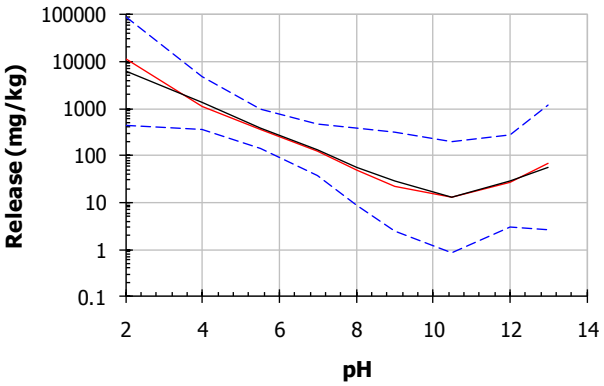
pH dependent concentration of Si



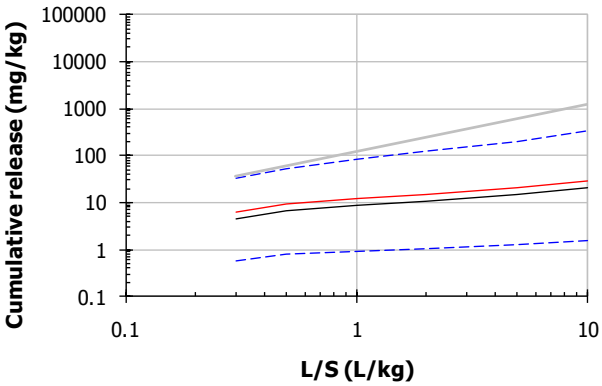
Si concentration as function of L/S



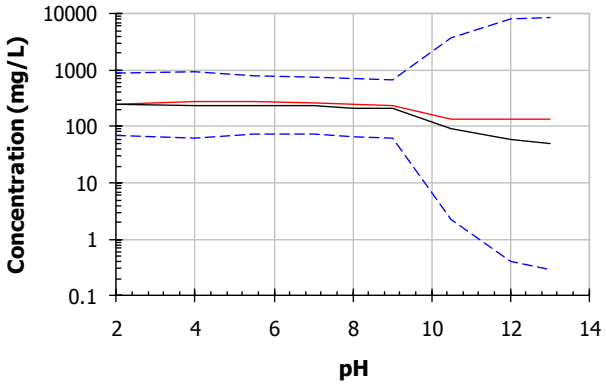
pH dependent release of Si



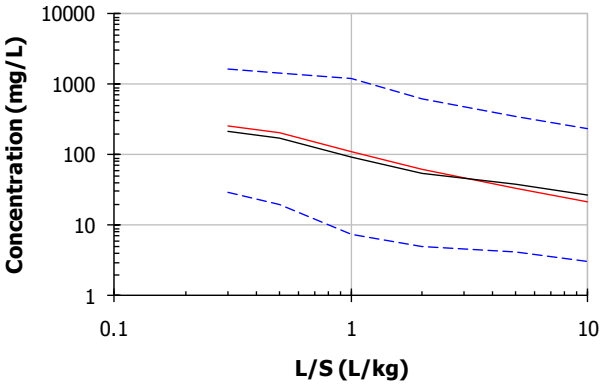
Cumulative release of Si



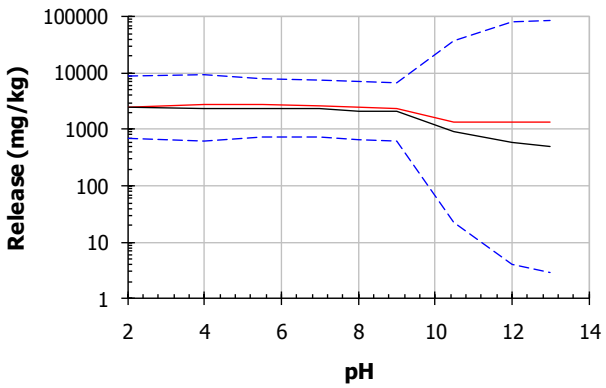
pH dependent concentration of S



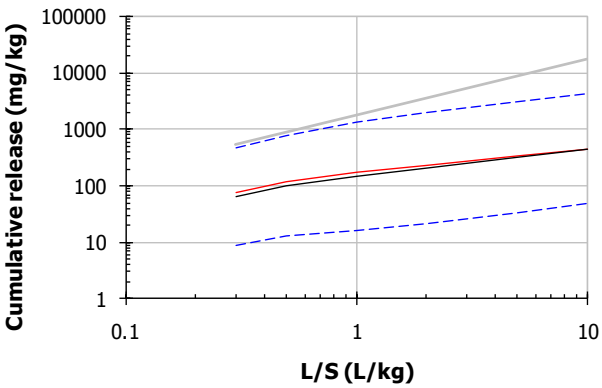
S concentration as function of L/S



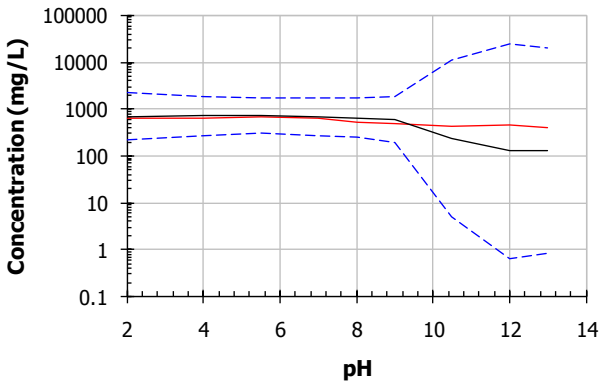
pH dependent release of S



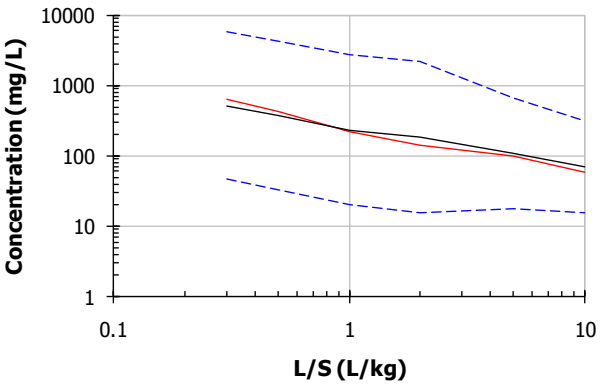
Cumulative release of S



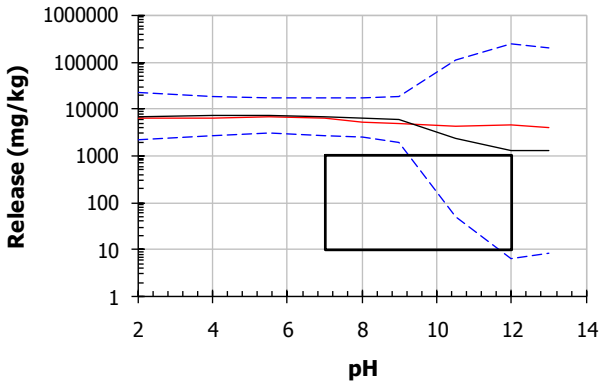
pH dependent concentration of SO4



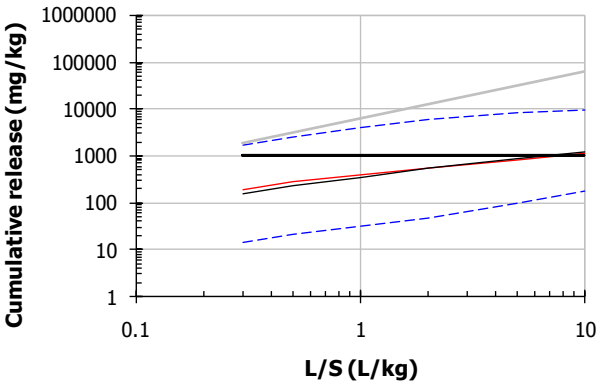
SO4 concentration as function of L/S



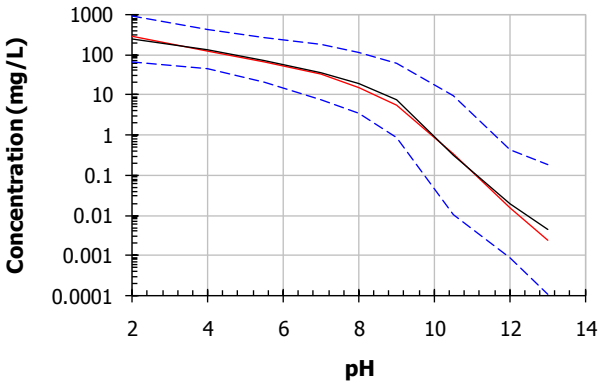
pH dependent release of SO4



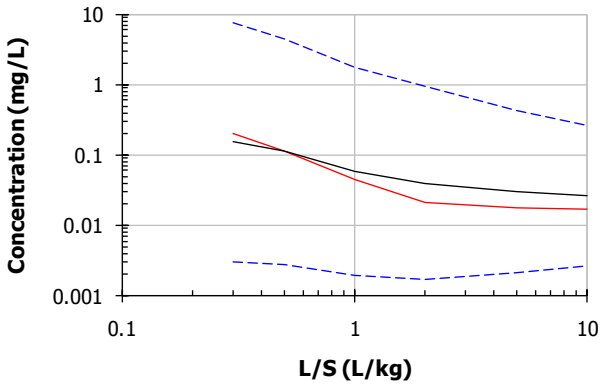
Cumulative release of SO4



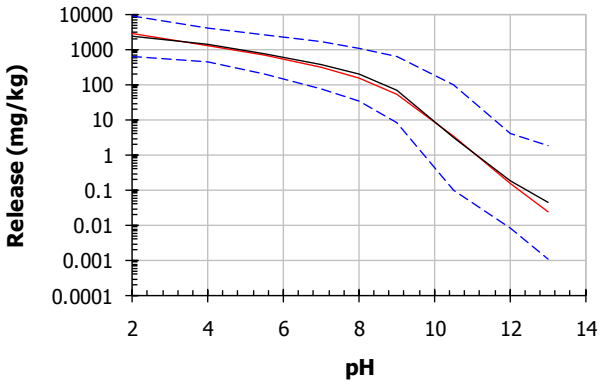
pH dependent concentration of Mg



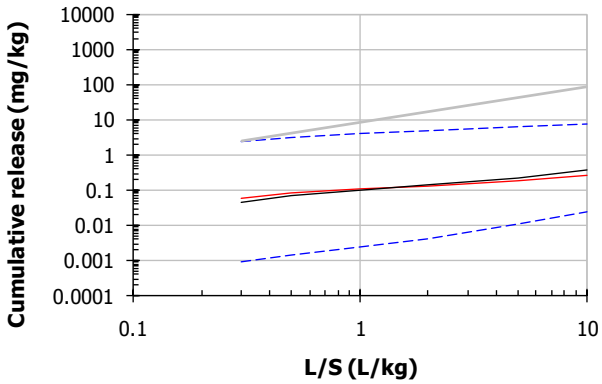
Mg concentration as function of L/S



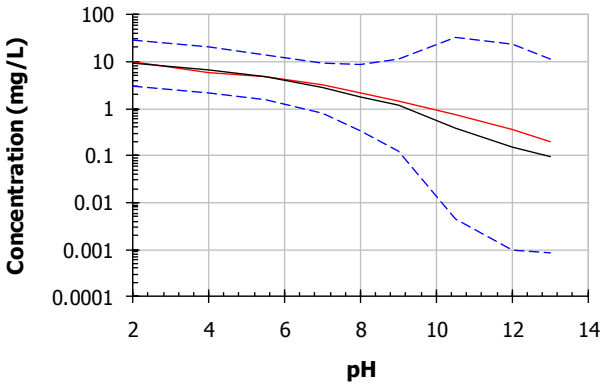
pH dependent release of Mg



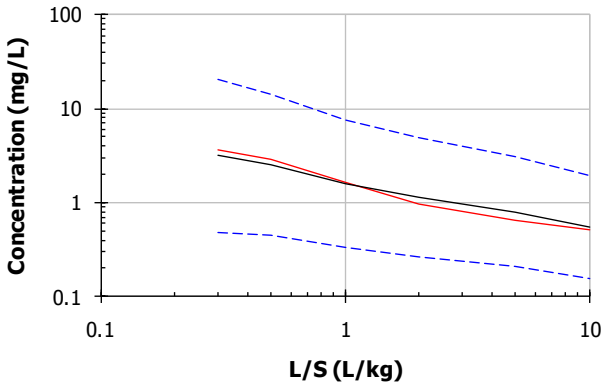
Cumulative release of Mg



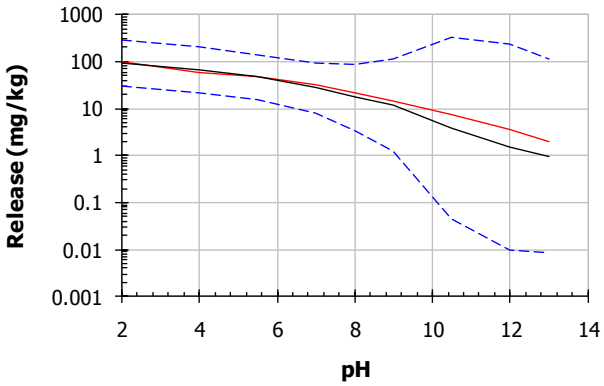
pH dependent concentration of Sr



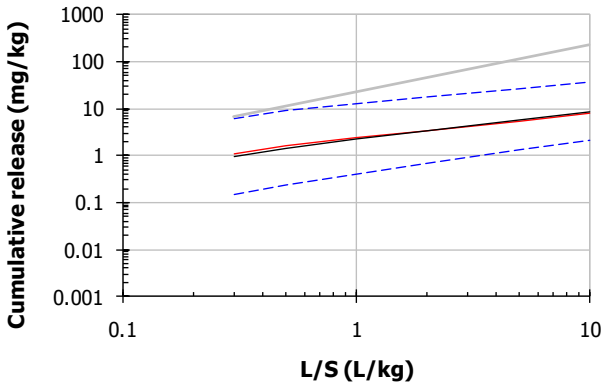
Sr concentration as function of L/S



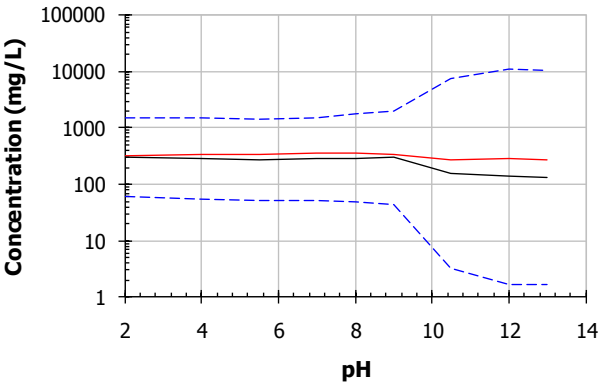
pH dependent release of Sr



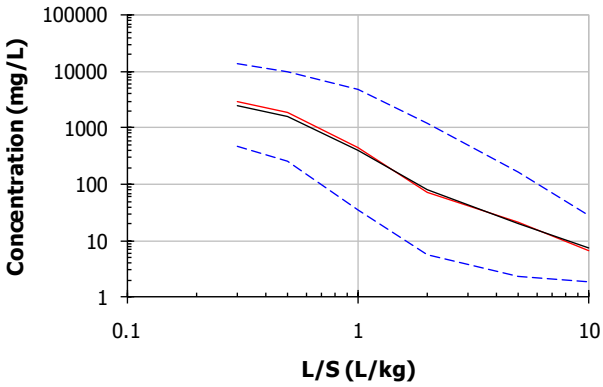
Cumulative release of Sr



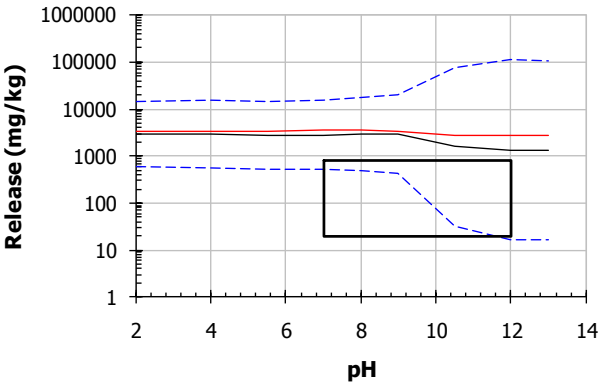
pH dependent concentration of Cl



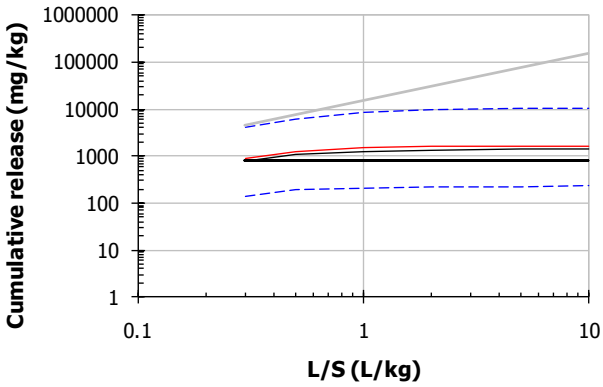
Cl concentration as function of L/S



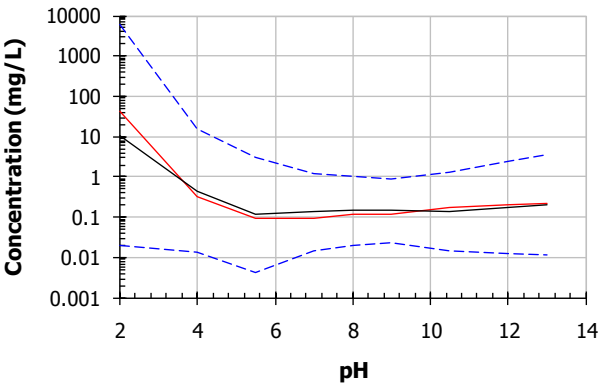
pH dependent release of Cl



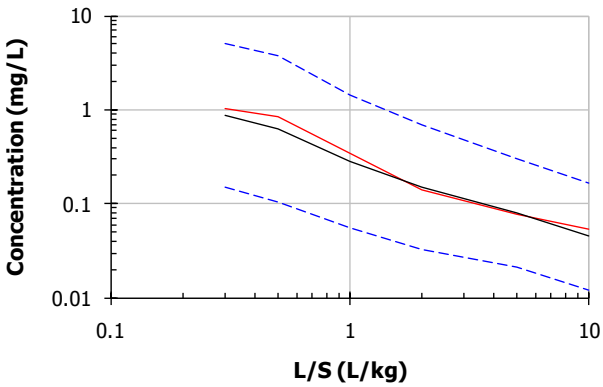
Cumulative release of Cl



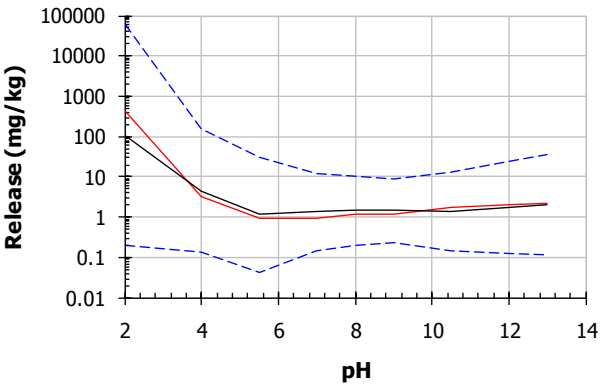
pH dependent concentration of P



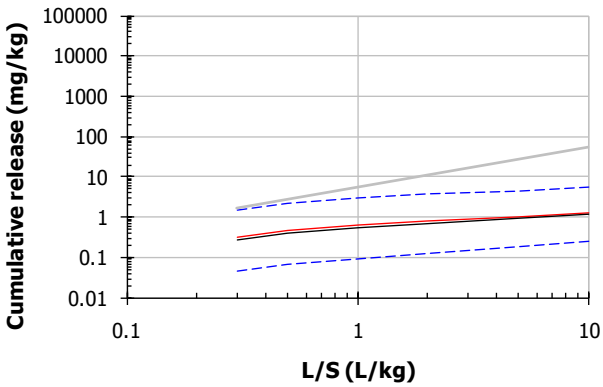
P concentration as function of L/S



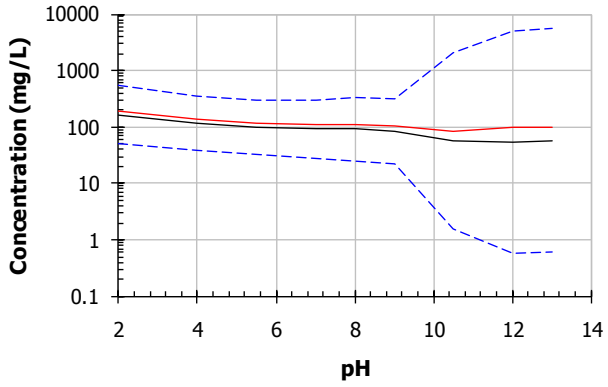
pH dependent release of P



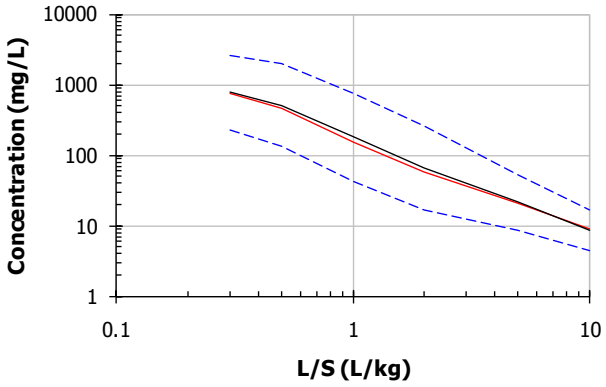
Cumulative release of P



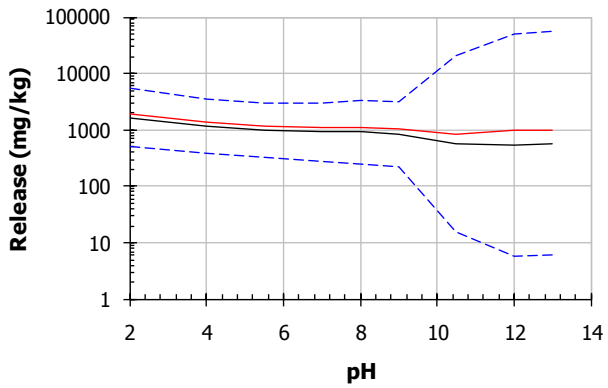
pH dependent concentration of K



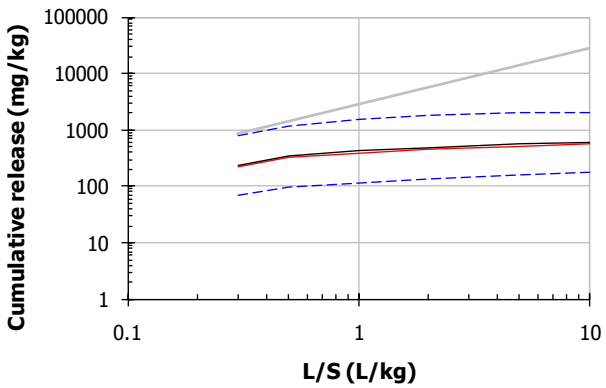
K concentration as function of L/S



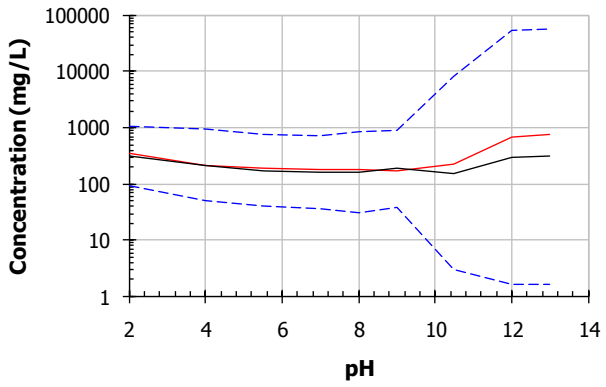
pH dependent release of K



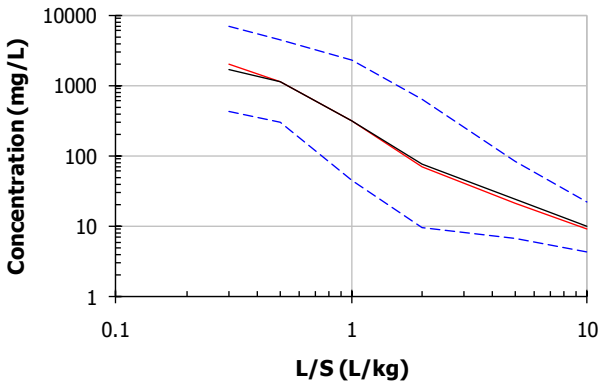
Cumulative release of K



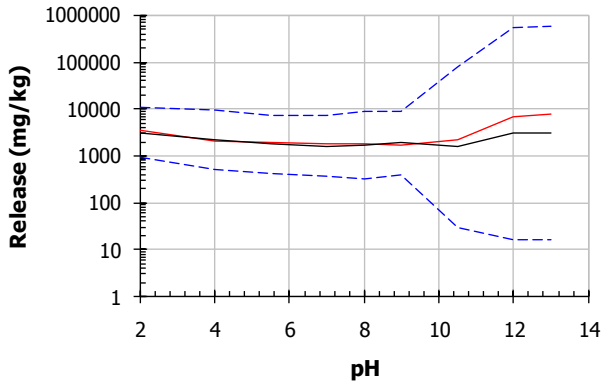
pH dependent concentration of Na



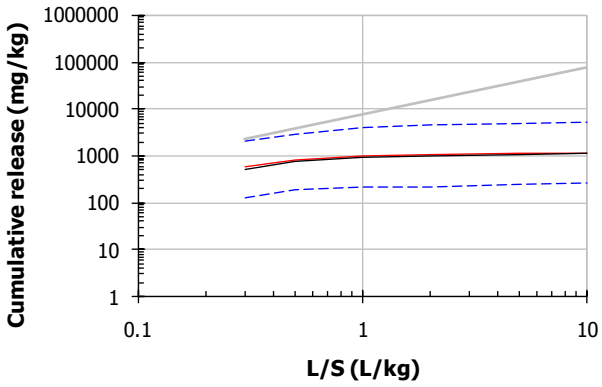
Na concentration as function of L/S



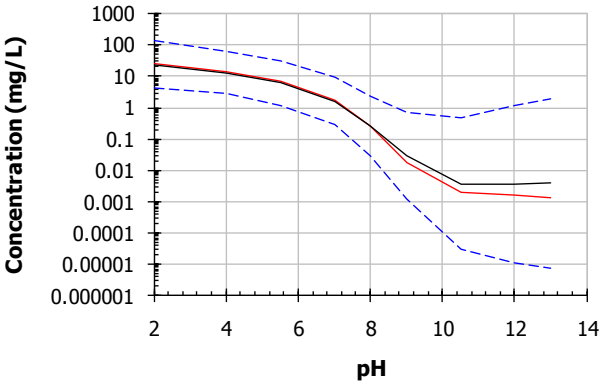
pH dependent release of Na



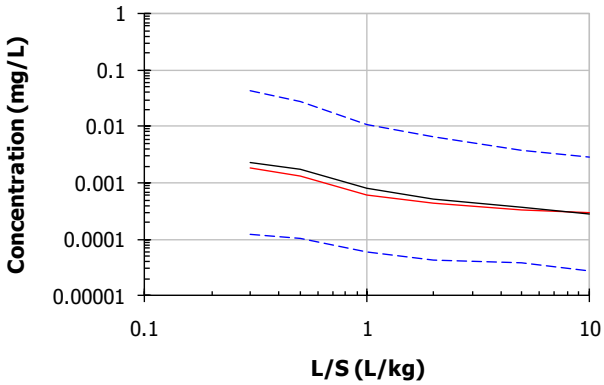
Cumulative release of Na



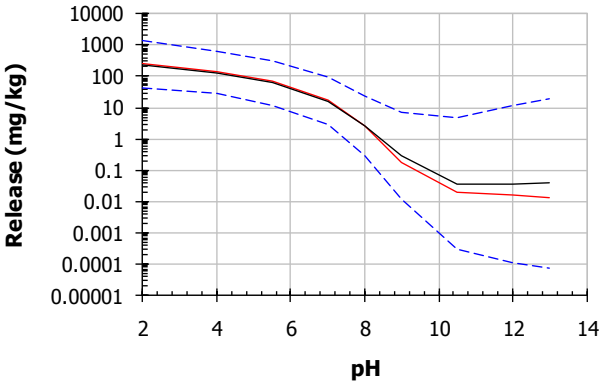
pH dependent concentration of Mn



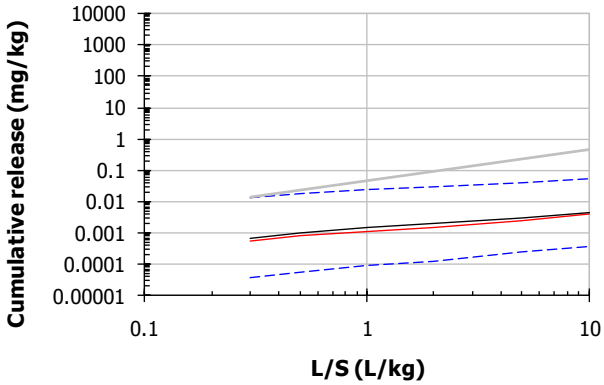
Mn concentration as function of L/S



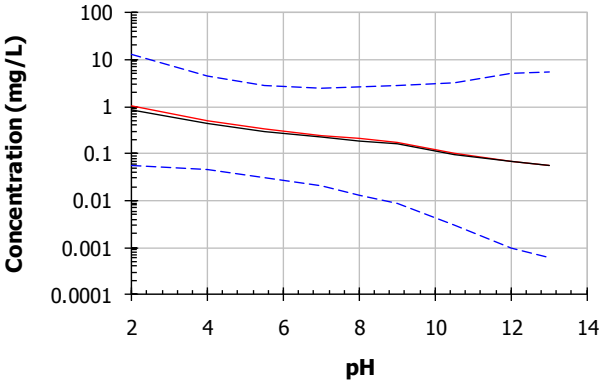
pH dependent release of Mn



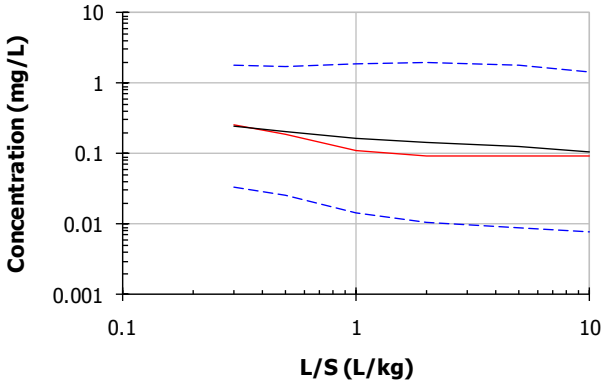
Cumulative release of Mn



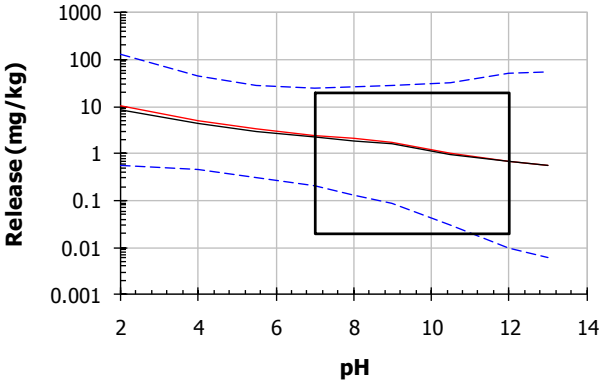
pH dependent concentration of Ba



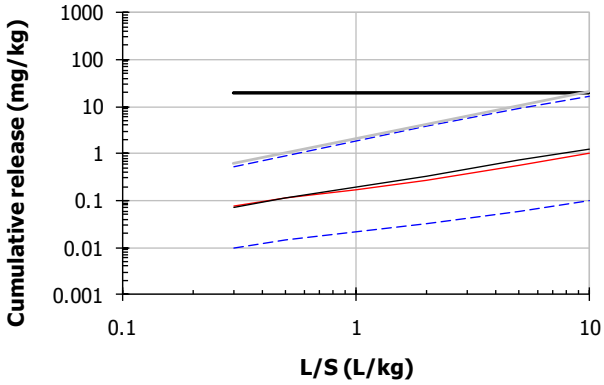
Ba concentration as function of L/S



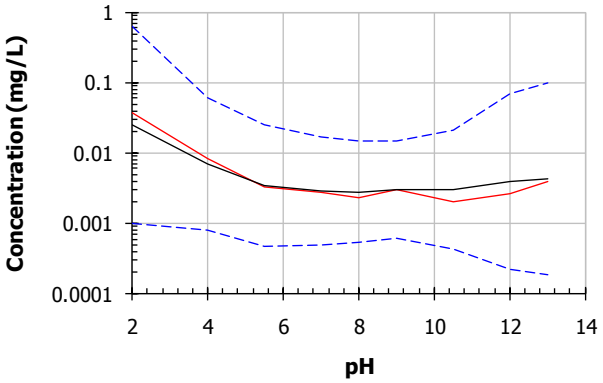
pH dependent release of Ba



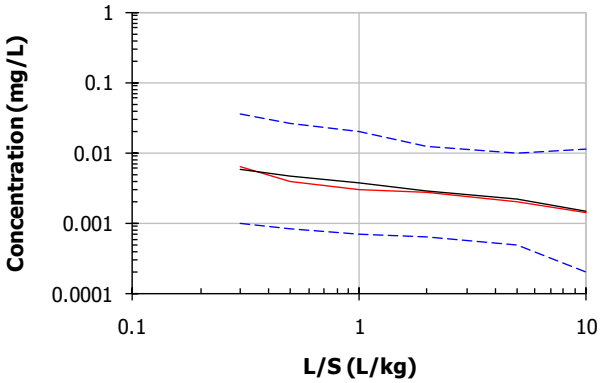
Cumulative release of Ba



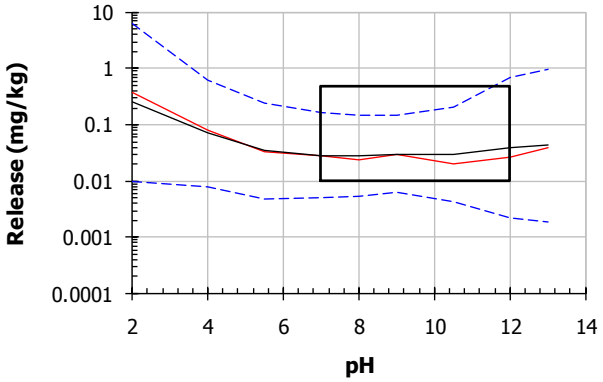
pH dependent concentration of As



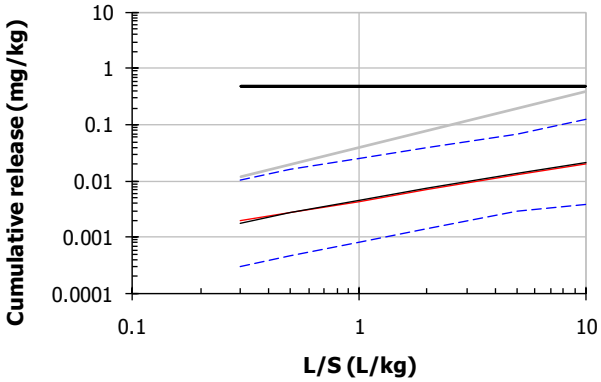
As concentration as function of L/S



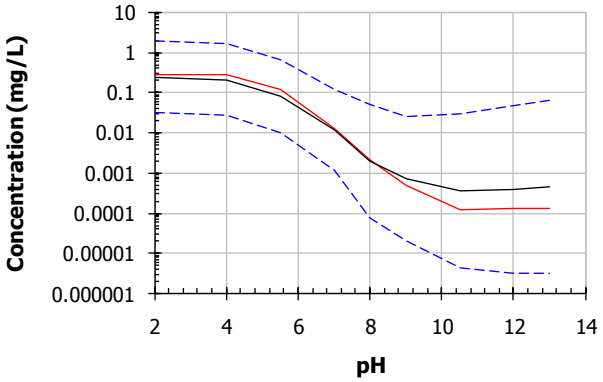
pH dependent release of As



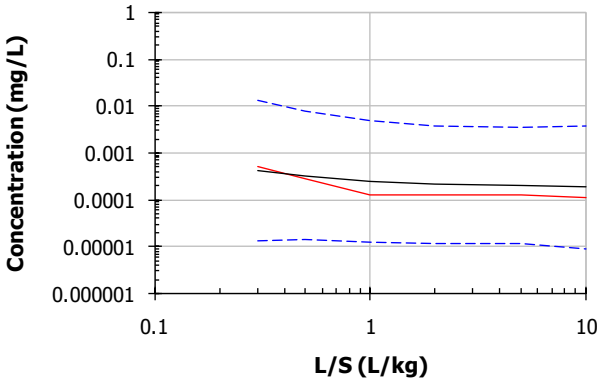
Cumulative release of As



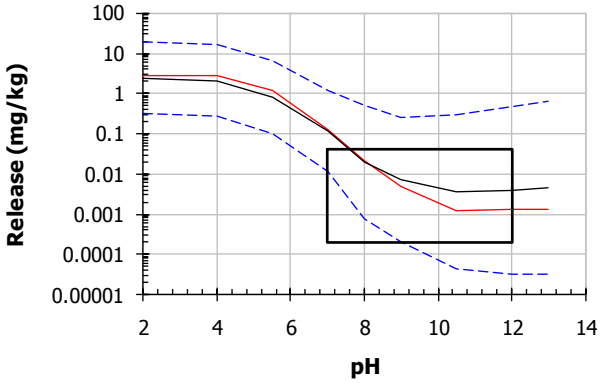
pH dependent concentration of Cd



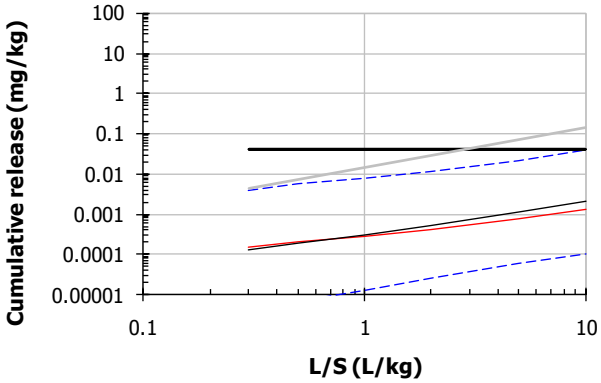
Cd concentration as function of L/S



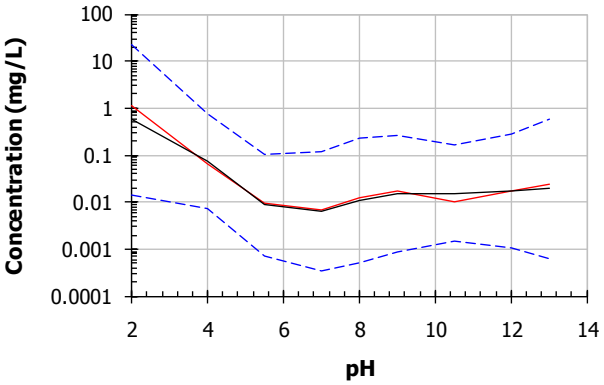
pH dependent release of Cd



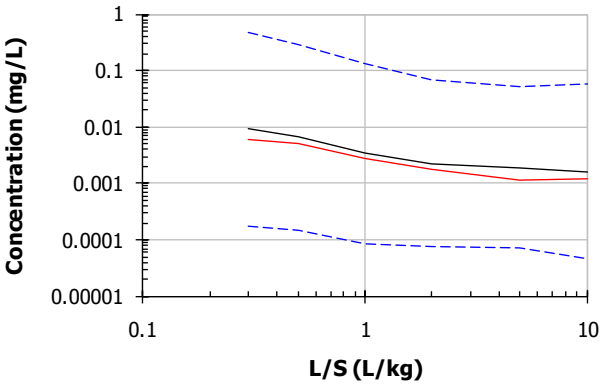
Cumulative release of Cd



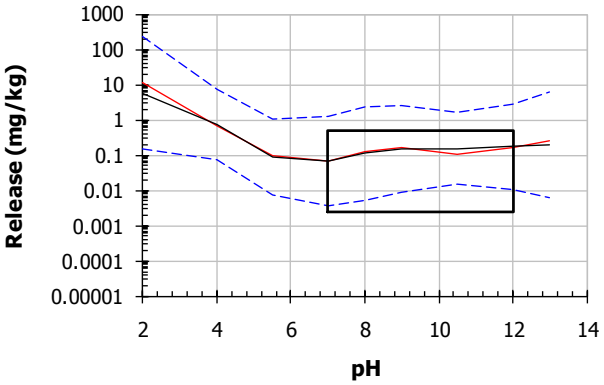
pH dependent concentration of Cr



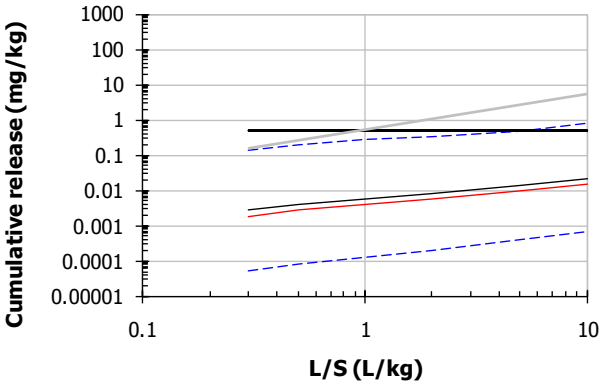
Cr concentration as function of L/S



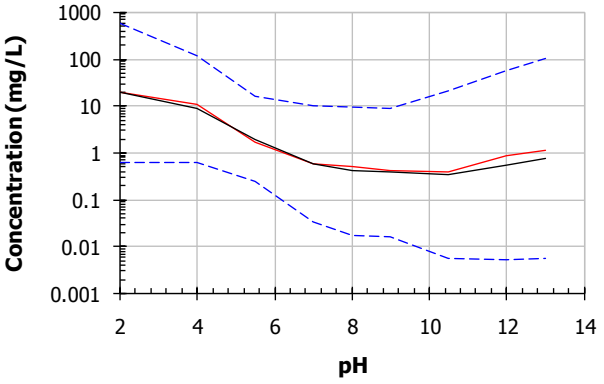
pH dependent release of Cr



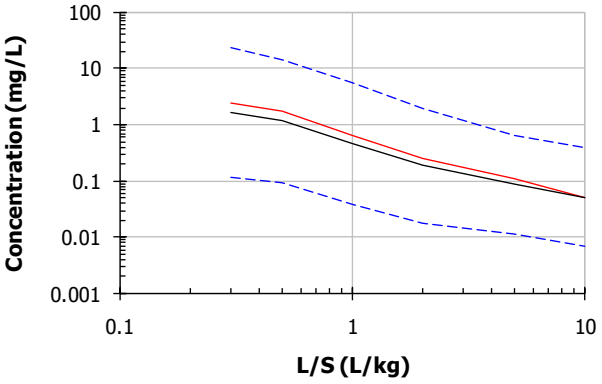
Cumulative release of Cr



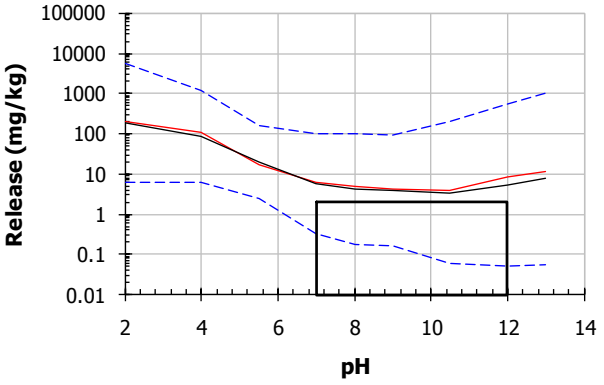
pH dependent concentration of Cu



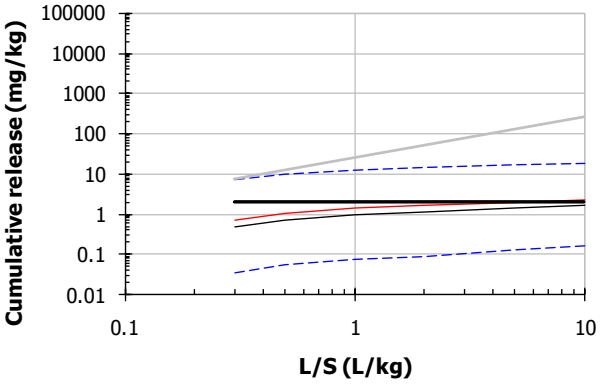
Cu concentration as function of L/S



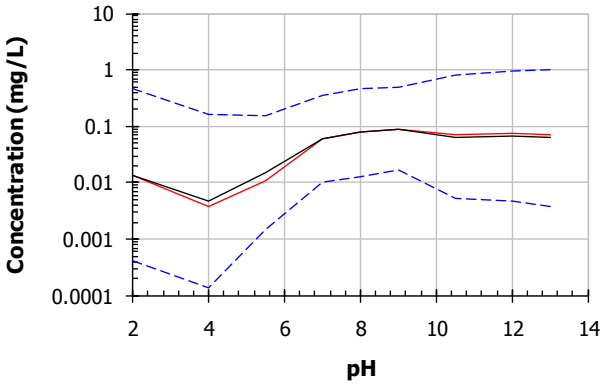
pH dependent release of Cu



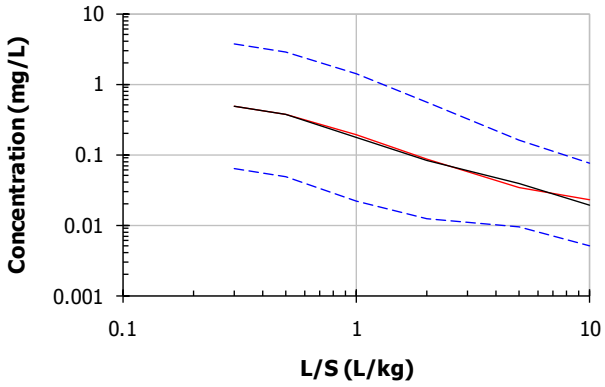
Cumulative release of Cu



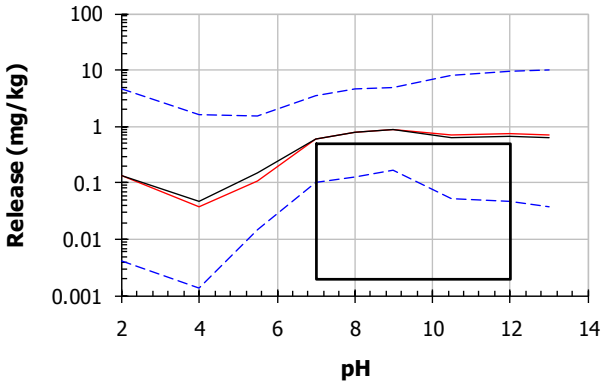
pH dependent concentration of Mo



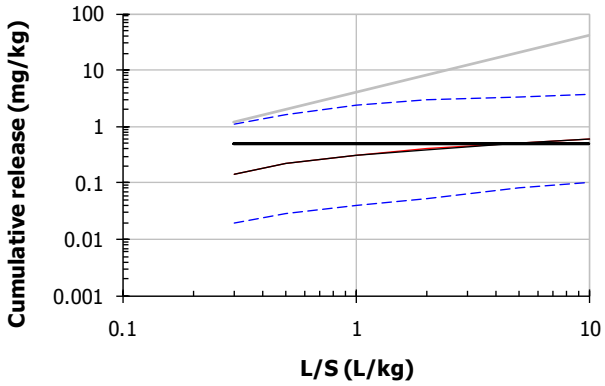
Mo concentration as function of L/S



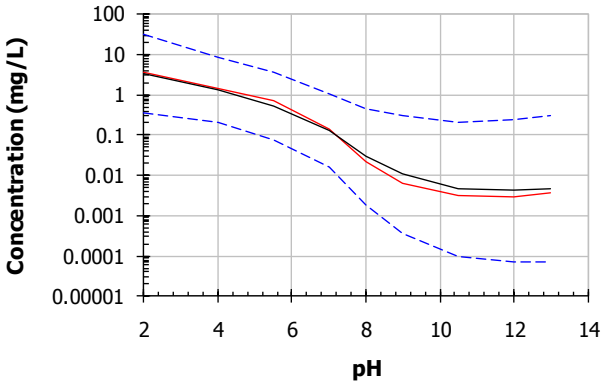
pH dependent release of Mo



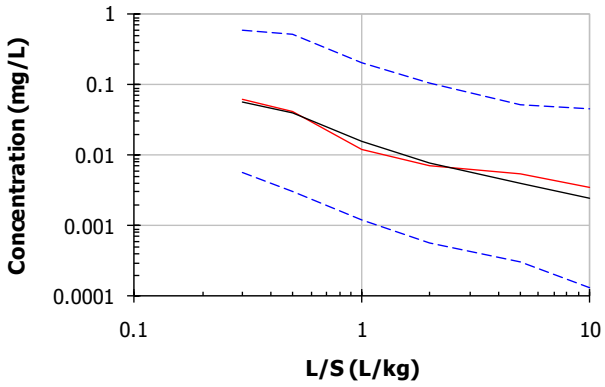
Cumulative release of Mo



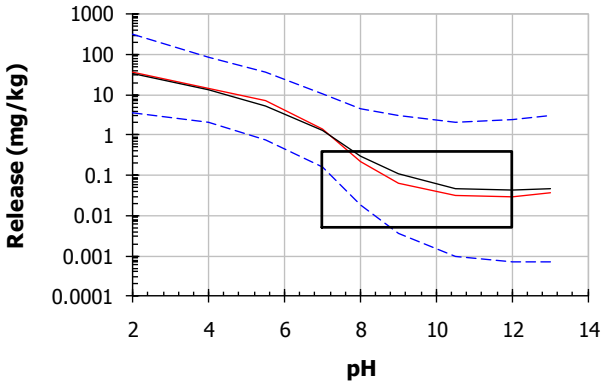
pH dependent concentration of Ni



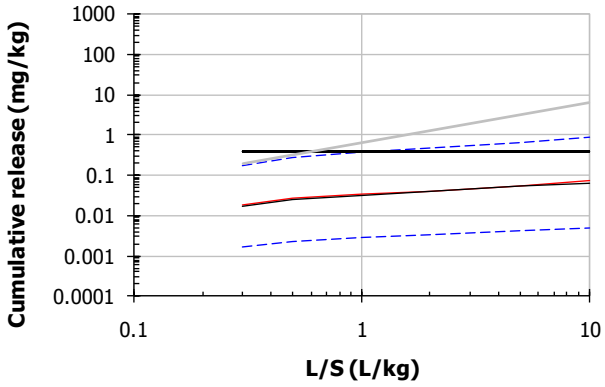
Ni concentration as function of L/S



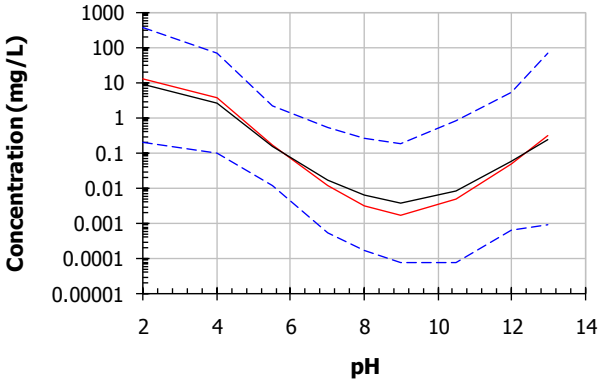
pH dependent release of Ni



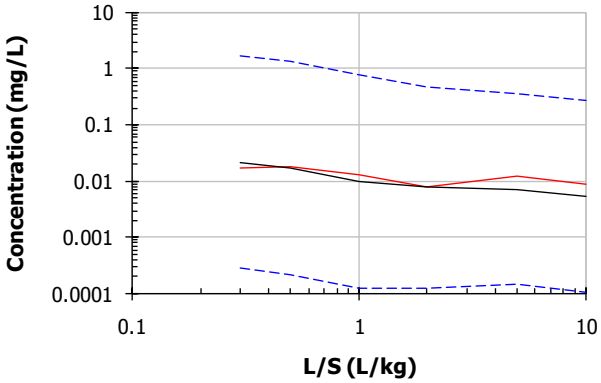
Cumulative release of Ni



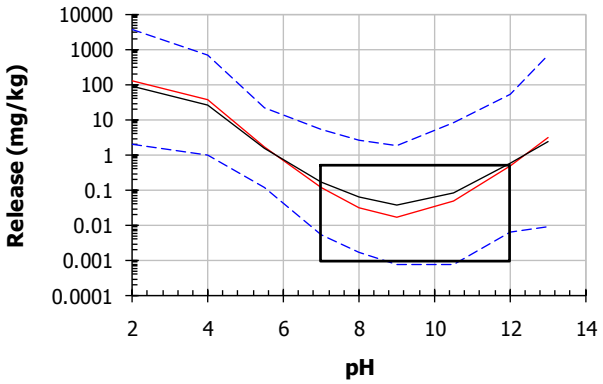
pH dependent concentration of Pb



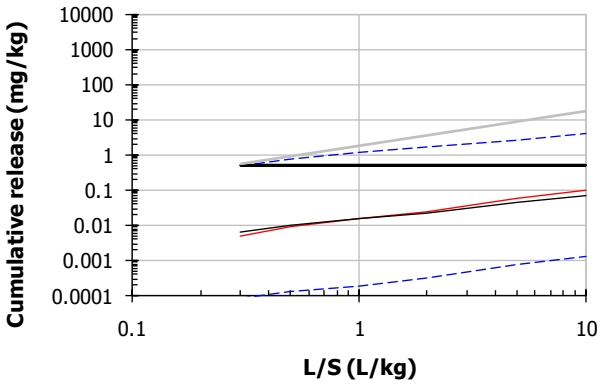
Pb concentration as function of L/S



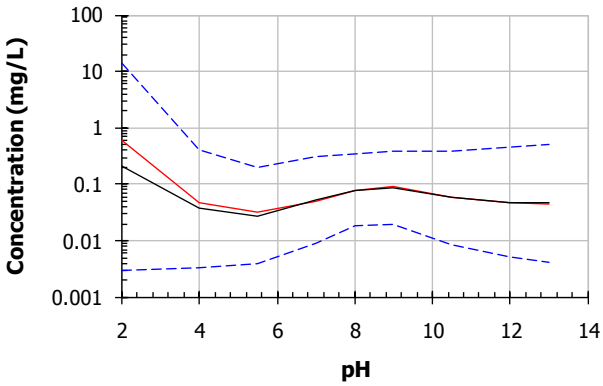
pH dependent release of Pb



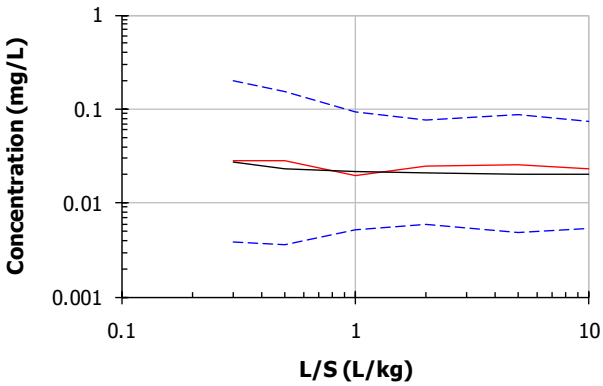
Cumulative release of Pb



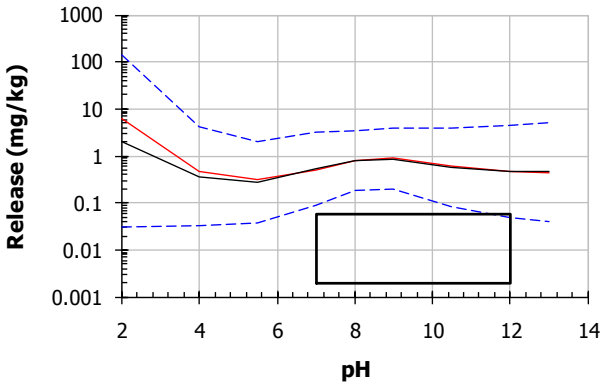
pH dependent concentration of Sb



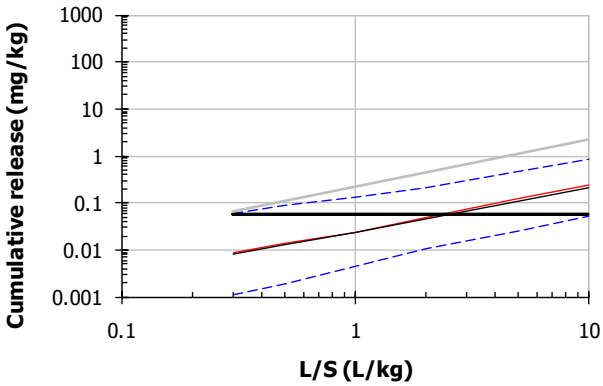
Sb concentration as function of L/S



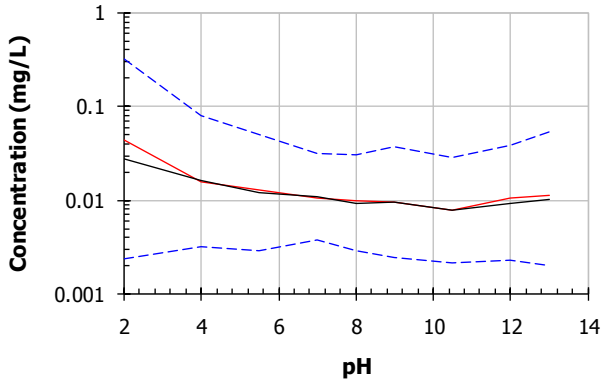
pH dependent release of Sb



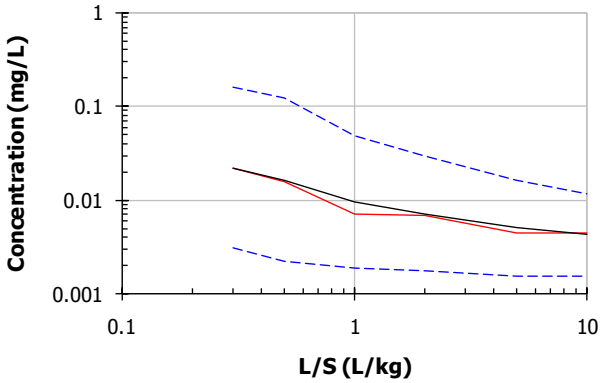
Cumulative release of Sb



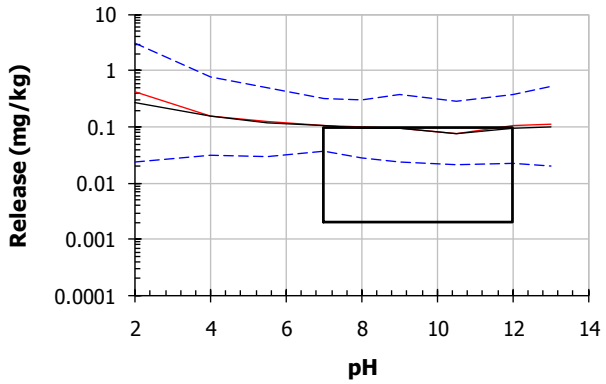
pH dependent concentration of Se



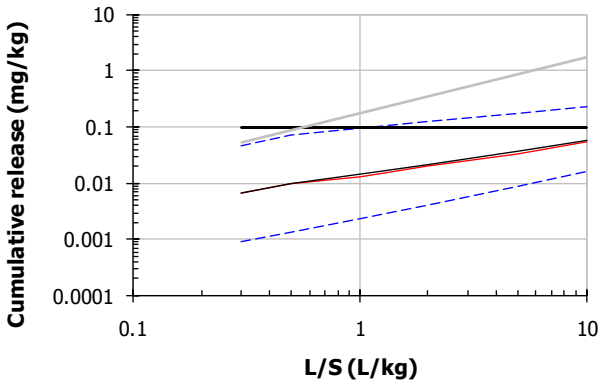
Se concentration as function of L/S



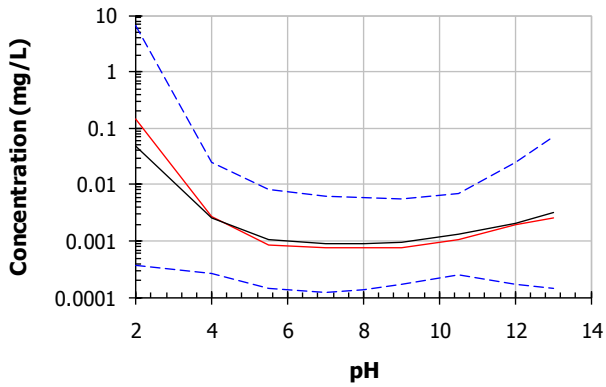
pH dependent release of Se



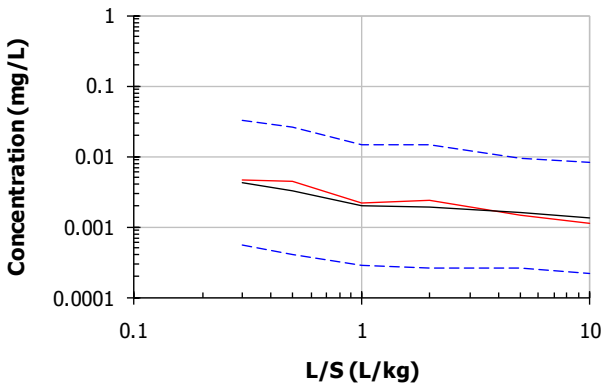
Cumulative release of Se



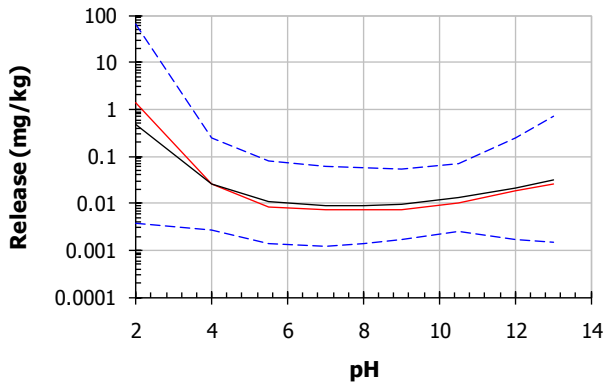
pH dependent concentration of Sn



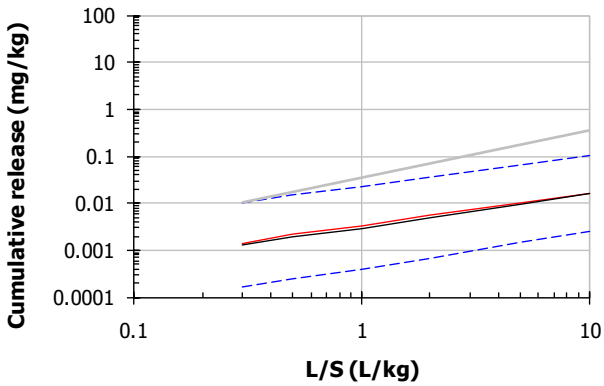
Sn concentration as function of L/S



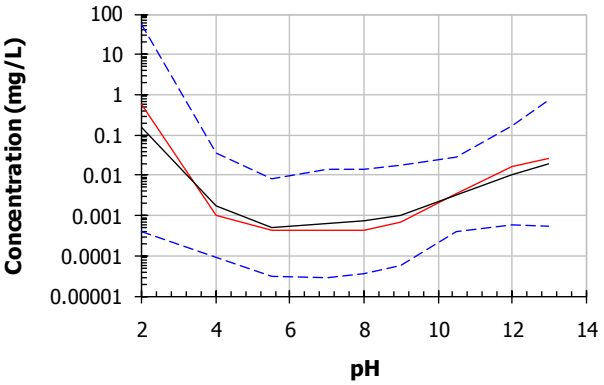
pH dependent release of Sn



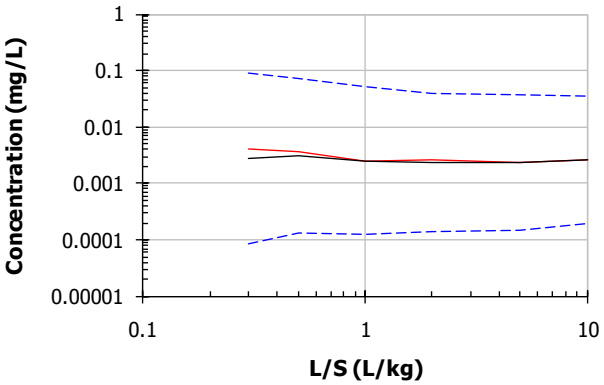
Cumulative release of Sn



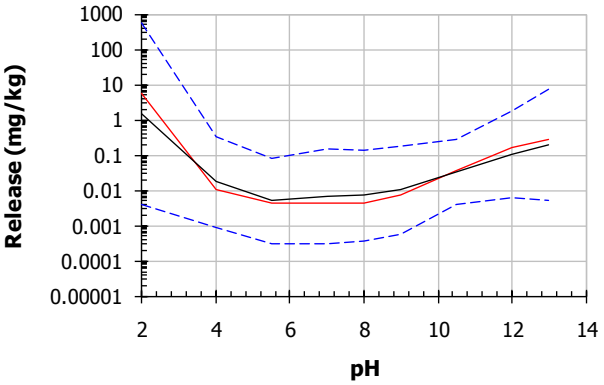
pH dependent concentration of V



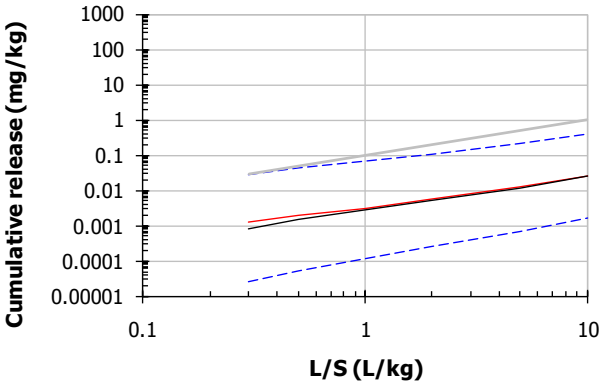
V concentration as function of L/S



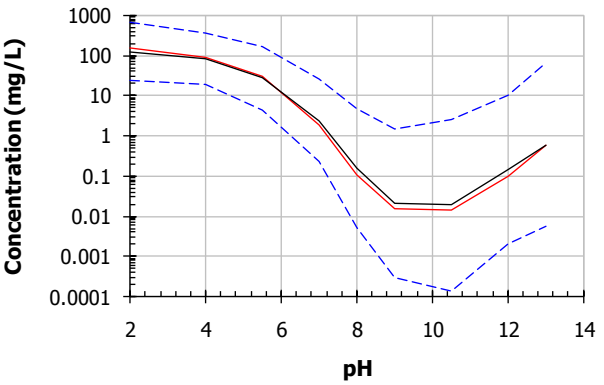
pH dependent release of V



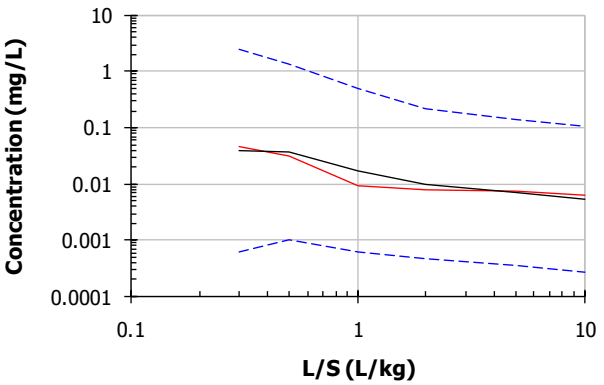
Cumulative release of V



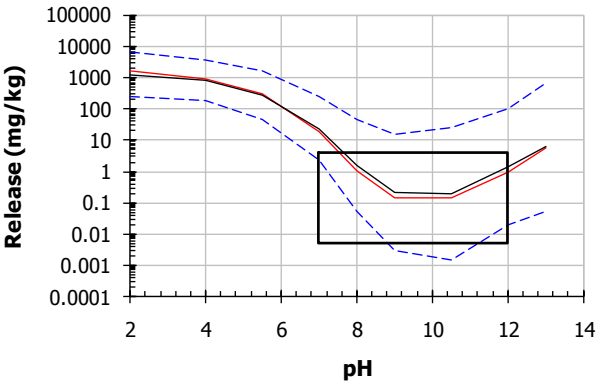
pH dependent concentration of Zn



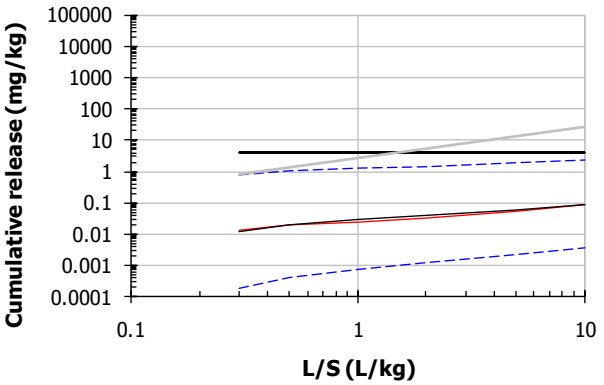
Zn concentration as function of L/S

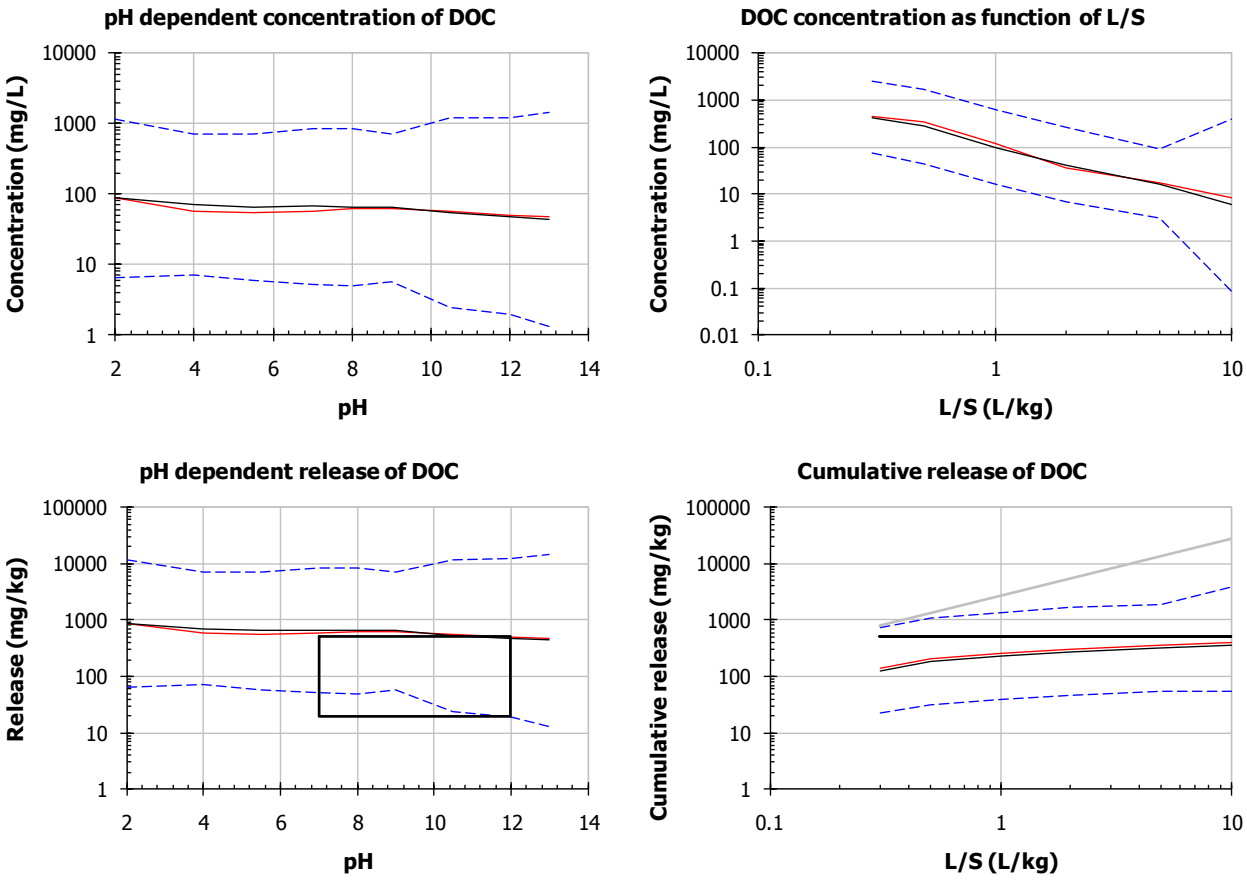


pH dependent release of Zn



Cumulative release of Zn





Legend

90 % confidence intervals

MSWI Bottom ash Median

MSWI Bottom ash Average

Box in pH dependence plot shows regulatory level (EU LFD Inert), relevant pH domain and detection limit. The horizontal solid line in the plot as function of L/S also reflects the regulatory level.

European Commission
EUR 26769 – Joint Research Centre – Institute for Prospective Technological Studies

Title: **Study on methodological aspects regarding limit values for pollutants in aggregates in the context of the possible development of end-of-waste criteria under the EU Waste Framework Directive**

Author(s): Hans Saveyn, Peter Eder, Elena Garbarino, Lenka Muchova, Ole Hjelmar, Hans van der Sloot, Rob Comans, André van Zomeren, Jiri Hyks, Anke Oberender

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Abstract

This report provides a methodology proposal for establishing limit values for pollutants in waste-derived aggregates with a view of using such aggregates in a wide variety of construction projects, as part of possible end-of-waste criteria for aggregates in accordance with Article 6 of the Waste Framework Directive (2008/98/EC). More specifically, the study centres on aggregate substances that are subject to leaching and/or release through wear. The report focuses on identifying and assessing the pollution risks of using aggregates derived from waste, on reviewing how the use of aggregates is regulated today in the EU with respect to avoiding pollution, on assessing the need for including limit values for pollutants in end-of-waste criteria, on assessing the suitability of different types of pollutant limit values, on identifying and assessing the different methodological approaches for deriving pollutant limit values and on identifying the most suitable testing approaches and methods, including simplified modes of compliance.

LF-NC-26769-EN-N

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